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Adapso suit alleges piracy

Group's campaign against illegal software copying spearheaded by case against American Brands

By Peter Bartolik
CW Staff

NEW YORK — Alleging software piracy, Micropro International Corp. and the Association for Data Processing Service Organizations last week filed a lawsuit against a Fortune 100 company and its subsidiary, which briefly held Adapso membership more than a year ago.

At a news conference held here Jan. 17, Adapso announced that a 20-count complaint was filed that morning in U.S. District Court in Chicago against American Brands, Inc., a conglomerate headquartered here that is the nation's fifth-largest cigarette manufacturer, and its Chicago-based office supplies subsidiary, Wilson Jones Co.

The lawsuit is the

spearhead of a vigorous antipiracy campaign formulated by Adapso, an industry association with 750 member companies involved in the computer software and services industry. In addition to the lawsuit, Adapso has embarked on an effort to develop standards for hardware-based software authorization systems (see story page 6) and has begun a corporate awareness campaign involving mailings to corporate executives and leaders of colleges and educational institutes.

American Brands and Wilson Jones are charged in the lawsuit with 20 counts involving copyright and trademark infringement, unfair competition and breach of license agreement arising from the unauthorized reproduction and distribution at Wilson

See **LAWSUIT** page 6

\$800 million toll

NEW YORK — For every authorized micro software business package, there exists one unauthorized copy, a situation that will cost U.S. vendors \$800 million in lost revenues in 1985, Future Computing, Inc. said here last week.

See **PIRACY** page 4

Micro-based Cobol tools make debuts

Microsoft Cobol enhanced to support four types of files

The list of microcomputer Cobol wares recently grew with the addition of two products. Microsoft Corp. enhanced its version of Cobol, and Micro Focus, Inc. introduced Professional Cobol, an application development environment.

Microsoft Cobol's features include dynamic call and cancel, built-in sort and merge and an Isam method that supports multiple keys, split keys and duplicate keys, according to the vendor.

Microsoft Cobol is said to support four types of files: sequential, line-sequential, relative and B-tree indexed. An Isam file recovery utility reportedly allows programmers to recover and restore damaged files.

Multiuser environments

The package's screen capabilities, based on Data General Corp.'s Cobol extensions, include cursor positioning, highlighting, automatic format conversion, prompting and automatic field skip, the vendor said.

The product contains record-locking and file-locking capabilities for multiuser environments, according to the vendor.

Microsoft Cobol requires 192K bytes of random-access memory, two

See **COBOL** page 10

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IBM and DEC square off/**61**

In Depth

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TOP OF THE NEWS

Management shake-up at AT&T. The company last week tapped Robert Allen, a former Bell Atlantic Corp. official, to head its Information Systems unit, while moving other top-level executives into new roles. **Page 2.**

Ivy League link. Dartmouth College is a beta site for an Apple Computer, Inc. local-area network product, although the college



is not using the network in the traditional manner. **Page 8.**

Amdahl Corp. rolled out a front-end processor said to multiplex data, voice and video lines over a high-speed transmission link. **Page 11.**

President Reagan settled a cabinet dispute by giving the U.S. Department of Defense limited review of high-tech export licenses, leaving primary authority with the Department of Commerce. **Page 79.**

FYI

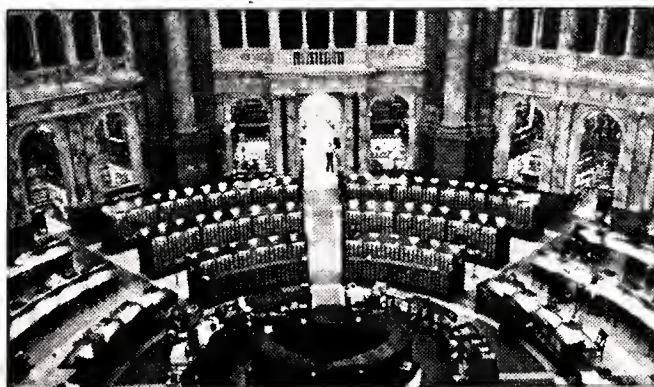
The death of a library tradition is in the cards

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — The main card catalog at the Library of Congress — the rows and rows of massive wooden cabinets that hold 23 million well-thumbed index cards — is gradually becoming obsolete as the library moves toward automation.

Traditionalists worry that they are losing a cherished national institution, a place where scholars can make serendipitous discoveries among the cards and where more than a few romances have started from chance encounters.

Library officials, on the other hand, assert that the evolving computerized catalog is a physical necessity at the world's largest library, which has to add two million index cards each year. The general collection's card catalog, which dates back to 1800, occupies several rooms — about the size of half a city block — and has 22 trays of cards on Shakespeare alone.



CW photo by M. Betts

The Library of Congress will eventually shelve its card catalog in favor of automated records.

Even with increasing automation, the old card catalog will not be abandoned for at least four more years, according to library spokesman Craig D'Ooge, mostly because the cards are being microfilmed. "And it's for certain that as long as there's a need for it, it will be accessible [to] scholars," he said.

But it is becoming obvious that the card catalog's days are numbered. In 1981, the catalog was "frozen" so that books obtained after Jan. 2, 1981, were recorded only in the computerized files. And by the end of 1984, virtually all of the library's English-language books were cataloged in the automated system

and available to researchers through 40 terminals in the library's reading rooms, according to John W. Kimball, head of the automation and reference collections section in the general reading rooms.

The automation has proceeded on two fronts. Since 1968, the

See **LIBRARY** page 10

NEWS

AT&T reshuffles deck in management shake-up

By Bryan Wilkins
CW Washington Bureau

NEW YORK — In a major management shake-up, AT&T last week named Robert E. Allen chairman of AT&T Information Systems, replacing Charles Marshall, who had headed the equipment marketing subsidiary since its formation in the year prior to AT&T's divestiture. Marshall was named executive vice-president responsible for personnel and external affairs.

Continuing the reorganization, AT&T, which has recently reported it would not meet sales and marketing goals for 1984, also announced that Randall Tobias, senior vice-president, will become Allen chairman of AT&T Communications, the regulated long-distance arm that is providing a major source of AT&T's revenue as the company continues to restructure.

Tobias replaces Morris Tannenbaum, who will become an executive vice-president responsible for financial management and strategic planning.

Not a surprise

"The changes really are not unexpected," commented Ken Bosomworth of International Resource Development, Inc., a Norwalk, Conn., consulting firm. "It's part of the ongoing reorganization of AT&T, which has been a continuous and profound process."

"AT&T has publicly said they

haven't done that well, in some cases meeting only 50% of their stated goals," he added. "In a sense, these changes show that [it isn't] willing to leave these same guys in charge. It's a form of cosmetic rejigging."

Allen has been an executive vice-president for corporate administration and finance at AT&T since the divestiture. He originally was named head of Bell Atlantic Corp., one of the seven regional holding companies, but in the months before the break-up, Allen was suddenly transferred to AT&T's New York headquarters.



The reorganization will have Marshall, Tannenbaum and Tobias reporting to Brown, while Allen will now report to James

E. Olsen, who continues as vice-chairman of the board and chairman of AT&T Technologies, the umbrella unit that provides equipment products, systems and services.

Steven Chrast, an analyst with Sanford C. Bernstein & Co., noted that the personnel shifts "appear to be anticipating the setting of the stage for the succession to Charles Brown," AT&T's chairman and chief executive officer. By naming Marshall and Tannenbaum to these positions, Brown is putting in place a structure that can be used to pick one of them as his successor when he retires, Chrast said. Brown recently announced that he would step down from his position in two years, when he reaches the age of 65.

Vendors post earnings

IBM, NCR report record increases for 1984; Apple, Wang notch first-quarter increases

By Peter Bartollik
CW Staff

IBM last Thursday reported a 1984 revenue of \$45.9 billion, a 14.3% increase over 1983. NCR Corp. also reported record 1984 results, and Apple Computer, Inc. reported a 121% increase in sales for the first quarter of fiscal 1985.

Wang Laboratories, Inc., however, fell short of its second-quarter goal, reporting an 18% increase in revenue and profits.

IBM's gross revenue just about met Wall Street expectations, and the 1984 profit was slightly above expectations, rising 20% to \$6.58 billion, or \$10.77 per share, compared with \$5.48 billion, or \$9.04 per share, in 1983.

However, fourth-quarter revenue was up just 12.4% to \$14.49 billion, compared with \$12.89 billion a year earlier, while profits showed a healthier 16% increase to \$2.27 billion, or \$3.55 per share, compared with \$1.86 billion, or \$3.06 per share, for the previous year, indicating IBM was able to cut costs to maintain healthy profits.

'The big winner'

Apple declared itself "the big winner" of the holiday selling season with its 121% first-quarter sales increase over the same quarter for the previous year.

Apple announced first-quarter sales of \$698.3 million, compared with \$316.2 million a year earlier. Profits for the quarter were \$46.1 million, or 75 cents per share, com-

pared with \$5.8 million, or 10 cents per share, in the comparable quarter of 1984.

Apple President and Chief Executive Officer John Sculley said the company sold approximately 500,000 computers during the last three months of 1984.

NCR reported last Monday that profits and revenue were at record levels in the fourth quarter and for fiscal year 1984. For the year, NCR reported a revenue of \$4.07 billion, up 9% from \$3.7 billion in 1983; profits for the year were \$342.6 million, or \$3.30 per share, up 19% from the 1983 level of \$287.6 million, or \$2.64 per share.

The fourth quarter, according to NCR spokesmen, resulted in a revenue of \$1.25 billion, up 10% from year-earlier revenue of \$1.13 billion. Profits for the quarter were \$123.9 million, or \$1.23 per share, up 8% from \$114.4 million, or \$1.05 per share, a year earlier.

Wang reported a second-quarter revenue of \$610 million, up 18% from \$515.4 million a year earlier. That increase fell far short of the 30% revenue growth goal set by Wang, which the company attributed to the strong U.S. dollar's negative impact on foreign sales and also to delays in releasing and installing new software products.

Wang's profits for the quarter also climbed 18% to \$56.3 million, or 40 cents per share, compared with \$47.8 million, or 35 cents per share, for the comparable period a year earlier, according to a company spokesman.

Upcoming Special Report to focus on graphics

What do users want from graphics systems and software, and how can DP managers best meet their needs? Find some answers in *Computerworld's* March Special Report on graphics systems.

The Special Report will focus on mainframe, minicomputer and microcomputer graphics and the blurred lines among them. It will look at computer-aided design for micros and easy-to-use graphics for mainframes.

Contributions to the Special Report should take one of two forms:

tutorial articles discussing issues or applications stories outlining a particular user firm's experience.

Articles may range from four to six typed, double-spaced pages. Artwork is also welcome. Authors should include brief biographies and telephone numbers at which they can be reached. The submission deadline is Jan. 25.

If you have a story you would like to tell, contact Janet Fiderio, Special Report Editor, *Computerworld*, Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

Want to be heard? Talk to us

Hard as we try to give our readers the most complete information available, some good news and feature stories never reach us.

Are you involved in an unusual application of DP technology in your company? Have you implemented successful cost-cutting strategies? Is something in your DP shop not working as designed?

Know any unsung heroes?

If so, we'd like to hear from you. *Computerworld* has established a reader hot line for information regarding items of interest to the computing community. Call us toll free at (800) 343-6474. Ask for Donovan White, assistant managing editor.

We can't be everywhere — but our readers are.

NEWS SUMMARY

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General Motors Corp. and other large-system users are encouraging vendor interest in adopting standards for open systems interconnection/12

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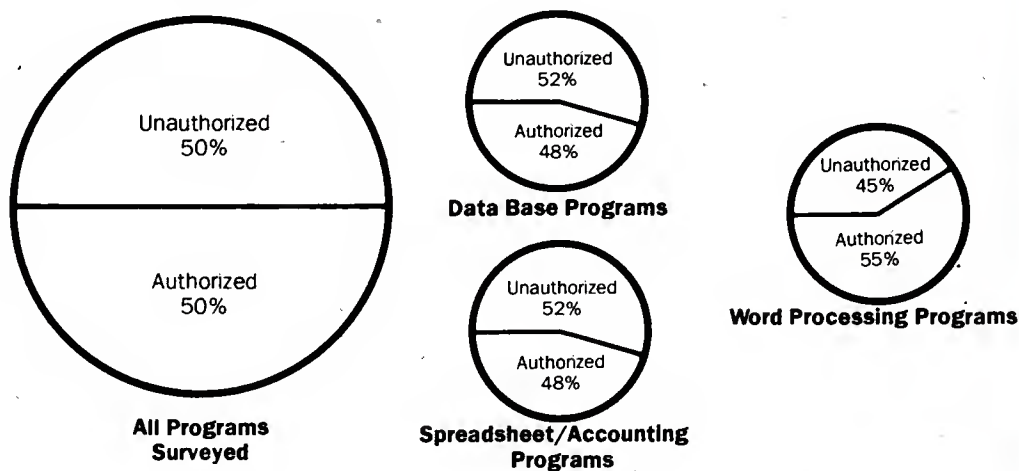
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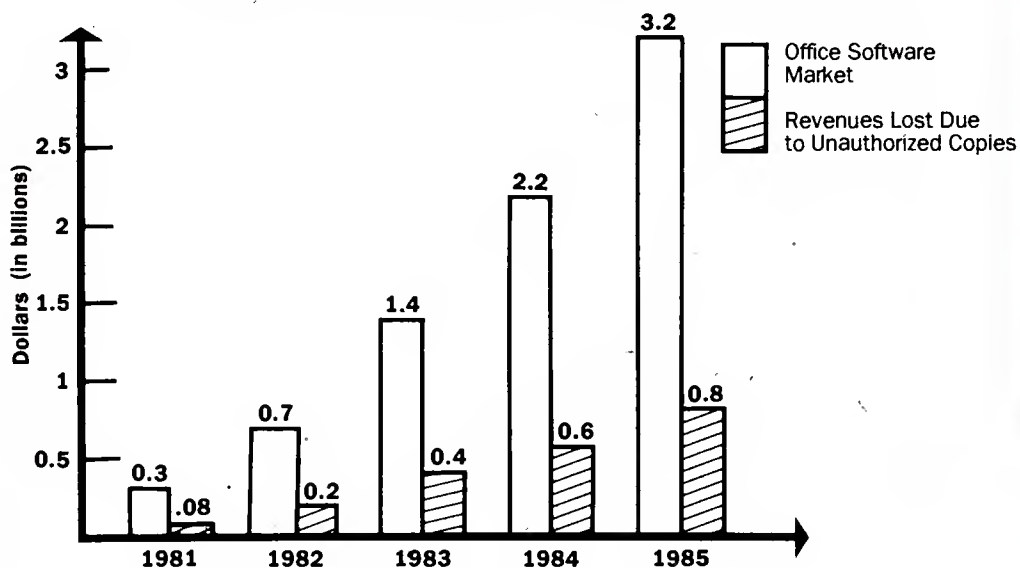
NEWS

PROPORTION OF UNAUTHORIZED AND AUTHORIZED COPIES OF OFFICE SOFTWARE SURVEYED



FUTURE COMPUTING, INC. CHARTS

IMPACT OF UNAUTHORIZED COPIES ON U.S. OFFICE SOFTWARE MARKET



PIRACY from page 1

During a news conference on software piracy held by the Association of Data Processing Service Organizations, Inc., the Dallas-based market research firm said that micro software piracy cost vendors an estimated \$1.3 billion in lost revenues between 1981 and 1984.

Future Computing said unauthorized copying deprives publishers of revenue that could support current products and finance future developments.

The estimates were developed from 45,000 responses to a survey mailed out last July to a representative sample of the U.S. work force.

According to the director of the survey, Joe Curry, Future Computing used data compiled by the U.S. Bureau of Labor Statistics to make an accurate estimate of the number of microcomputer business software packages in use by the entire U.S. work force.

The firm mailed the survey to households that had participated in earlier questionnaires on various products. Follow-up telephone calls were made to 1,400 respondents to account for sharing of packages and use of one package by one person both at home and at work.

Respondents were not asked whether they possessed unauthorized copies, but they were asked to indicate which of 12 packages were in use at home and at work. Although it was not possible to determine whether the unauthorized packages were in use at work or at home, Curry noted, "In some cases, the number of packages in use at home approached the total number of packages that the publishers estimated had been sold."

"

The least reliable data was the publishers' estimates, because it was difficult to determine how many packages were still in distribution channels, how many were bundled with hardware and how many were covered by multiple copy licenses.

Curry said the least reliable data was the publishers' estimates, because it was difficult to determine how many packages were still in distribution channels, how many were bundled with hardware and how many were covered by multiple copy licenses. The projections of copies in use by the entire U.S. work force were statistically accurate, and the research firm was conservative in its estimates, Curry said.

The projected revenue loss of \$800 million for 1985 was determined by assuming that approximately 25% of the unauthorized copies would otherwise have been purchased, according to Curry.

Further information on the survey is available from Future Computing, 8111 LBJ Freeway, Dallas, Texas 75251.

Suit to incite awareness

By Peter Bartolik
CW Staff

The software antipiracy campaign begun in New York last week by the Association of Data Processing Service Organizations (Adapso) was designed to prompt U.S. corporations to establish their own antipiracy policies.

High-profile lawsuits, such as the one filed last week by Adapso, and similar cases filed in the past by Lotus Development Corp., "will impact major corporations — the Fortune 500 and Fortune 1,000," according to Joshua J. Kaufman, a partner in the Washington, D.C., firm of Kaufman and Biel and editor in chief of "Computer Crime Digest." At that level, he added, memorandums prohibiting unauthorized software copying will be distributed. "This will generate greater publicity and awareness that it is illegal [to copy], that it is wrong," Kaufman said.

Robert Bigelow, a partner in the Boston law firm of Bigelow and Saltzberg, said the Adapso campaign and lawsuit may be comparable to successful campaigns that large textbook publishers waged against copying services. He added

that it is possible that employees who actually make unauthorized copies could be held personally liable.

Jay BloomBecker, director and founder of the National Center for Computer Crime Data in Los Angeles, said the relative ease with which software can be copied, combined with its sometimes hefty price tags, makes copying alluring to users. He said he believes 95% of all piracy could be stopped if manufacturers would adopt protection procedures, something he claimed vendors have been reluctant to do because of marketing considerations.

Kaufman added that the price of software may play a large role in unauthorized copying, particularly outside of large corporations. "Somebody might see a software package and like to have it but doesn't want to spend the money or can't afford to," he said. Within the corporate environment, he added, middle managers may be under pressure to increase productivity without increasing budgets or may be frustrated by the bureaucratic procedures required to acquire a package.

Beware the in-house pirate

BOSTON — Software piracy represents one of the most common ways for firms using personal computers to become embroiled in lawsuits, William H. Murray, IBM's program manager for data security, warned in a speech to the New England Computer Law Forum here last week.

Some software vendors are litigious, Murray said, and are gunning for those who pirate their products. He said that IBM has undertaken an in-house educational effort to prevent its employees from pirating other vendors' software and will fire workers who are caught doing it.

During an interview, Murray added that the use of a hardware key is among the options IBM has considered as a means to secure its software from illegal copying. A hardware key

plugs into a port or expansion slot on a personal computer and interacts with a program's antipiracy software to allow the program to run only on that machine.

Murray also told the Law Forum, a group of New England lawyers specializing in legal issues related to high technology, there is a misconception that whatever comes out of a computer is accurate. The data that a report or chart is based on, he argued, may itself be in error.

Anyone who uses a personal computer to produce reports and charts should "label data as to its source and authority." They should also identify work that was produced on a personal computer, and those who use the data should make an effort to verify its accuracy, he added.

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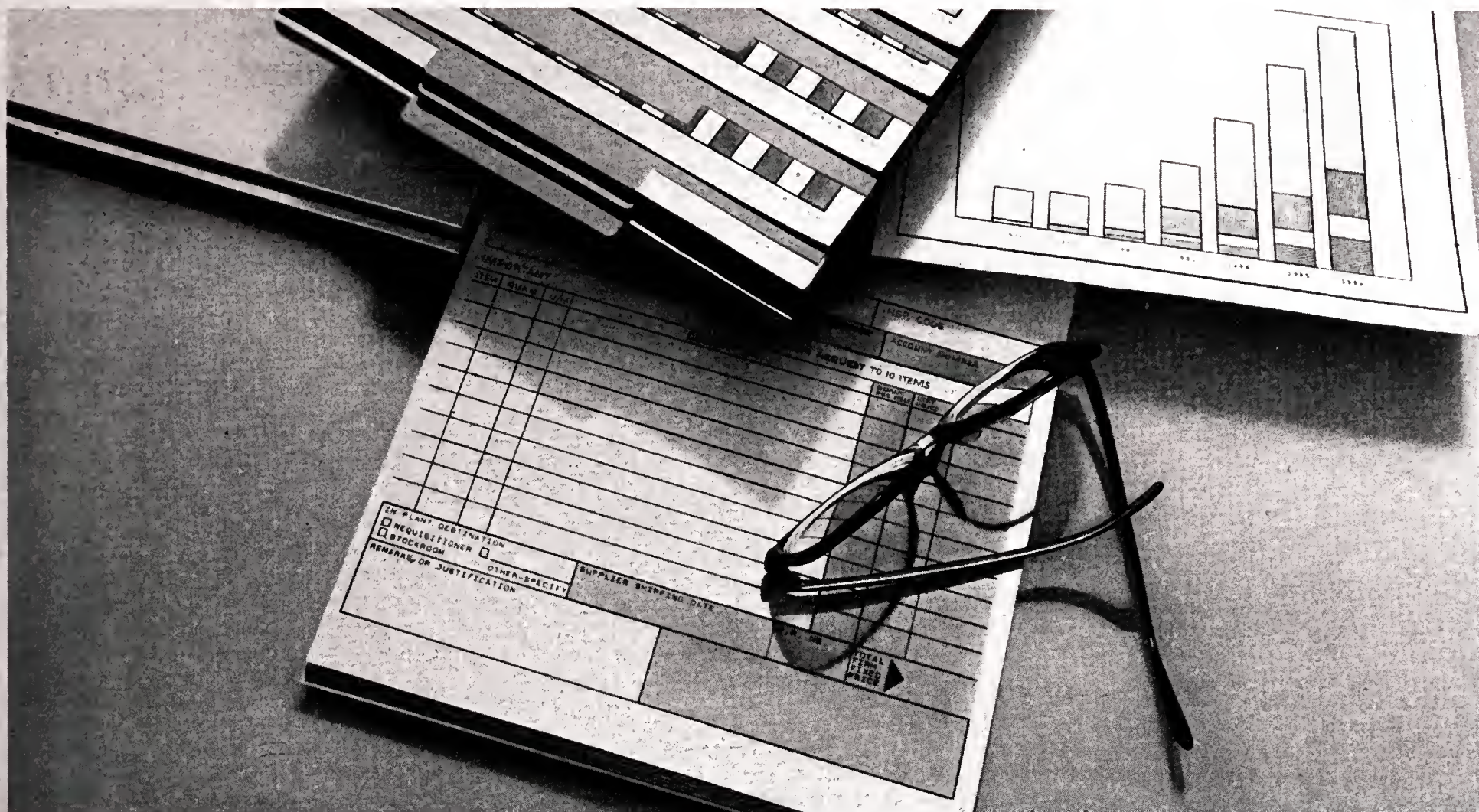
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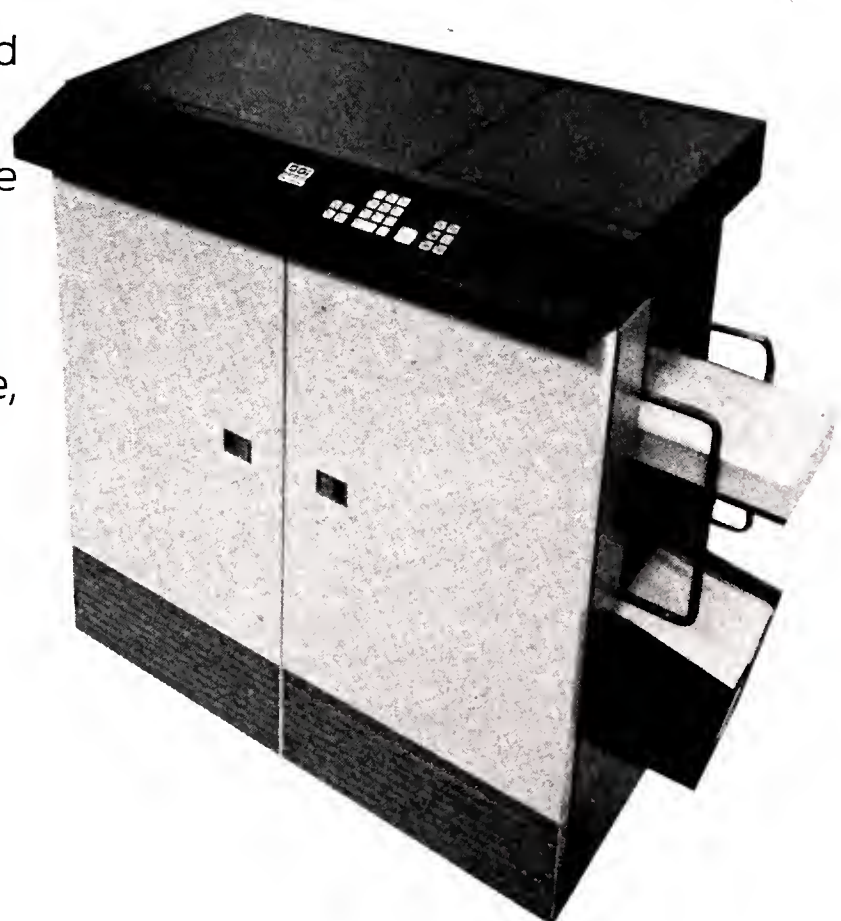
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NEWS

Response mixed to Adapso's software protection key

By Eric Bender
CW Staff

NEW YORK — The work of the Association of Data Processing Service Organizations (Adapso) to develop a microcomputer software copy-protection scheme, one of the main thrusts in the anti-piracy campaign discussed here last week (see story, page 1), has drawn mixed initial responses.

While applauding the work's intent, experts noted that the scheme would not give bulletproof protection against piracy and might further complicate users' lives. "It's a step in the right direction, but it stops at about 1983," said Brian Boyle, analyst with Gnostic Concepts, Inc. in San Mateo, Calif. "What about networking? What about site licensing?"

Resistance to copy protection in corporate America "is real and sometimes for good reasons," said Russell Gee, vice-president at Access Technology, Inc., a software supplier in South Natick, Mass.

"It's a love-hate thing" for DP managers, Gee suggested. "They're looking for protection to make their jobs easier, and they can lower their maintenance problems and their risk exposure. On the other hand, more overhead is exactly what those guys don't need."

Adapso's Software Authorization Committee began to circulate a working draft of its work to-

ward a technical copy-protection solution late last month.

The development effort, described at the press conference here, has produced a scheme combining a lock built into the software program with hardware "keys" that plug into a portable "key ring."

The ring attaches to an RS-232 port via a cable with a pass-through connector, avoiding the need for a dedicated port. In operation, the program lock interacts with the key and key ring to get the authorization that allows the program to run. Many variations on the scheme are possible, providing different levels of protection, the report noted. Hardware standards and communications protocols would be placed in the public domain.

While committee members cautioned that the concept is far from a finished proposal, they point to a number of potential benefits for both vendors and users.

On the vendor side, the scheme would boost technical barriers to copying, although the draft report acknowledged that no method can provide complete protection.

Adapso's approach could provide "a vast array of benefits" for users as well, according to Marv Goldschmitt, committee member and vice-president for business development at Lotus Development Corp.

Among these benefits, he said, the approach would simplify legal copying for archival and backup purposes, allow trial use of software and permit software to run directly from a hard disk drive or from a local-area network (with authorization at individual workstations). The scheme also could provide a way for large-scale users to supervise microcomputer operations by controlling personal computers rather than diskettes.

Other customized implementations might include encryption, use of the key ring as an identifier for access restrictions on networks and bundling the key with other peripherals such as modems, according to the committee.

"We're in a unique position," Goldschmitt said. "We're in an industry dealing with intellectual property, and we're in a position to do something technically."

But the committee also noted that the approach raises potential user problems, including failure or loss of the hardware device and loss of data because of data-line collisions. These collisions could occur in multitasking environments if incoming data arrives at the same time the program is interrogating the key ring. However, committee member Michael Strickland, engineering director at Quadram Corp., said the group is confident that a technical solution can be found that will not require a dedicated port.

LAWSUIT from page 1

Jones of three products from Micropro: Wordstar, Mailmerge and Spellstar.

The suit alleges that copies were made for use or distribution at one or more sales training seminars.

The lawsuit charges that the two companies have "engaged in unau-

thorized distribution and copying and will continue to do so," and charges willful knowledge of the practice and disregard for Micropro's rights.

Adapso and Micropro, co-filers of the suit, asked for damages of \$225,000, the return of any profits the companies earned as a result and sufficient damages to be determined by the court.

No comment

Adapso declined to comment on how many unauthorized copies of the software were allegedly made or the number of authorized licenses granted to Wilson Jones by Micropro; the organization also declined to say how the alleged piracy was discovered.

An official spokesman for Wilson Jones was not available for comment at press time, but an executive of the company's MIS department said he was not aware of the suit.

American Brands spokesman Dan Conforti said Thursday the company could not comment because it had not been served any legal papers pertaining to the suit and had only heard of it indirectly. Asked if the conglomerate had an official policy prohibiting unauthorized copying of trademarked and copyrighted materials, Conforti replied, "Of course we would never [allow unauthorized copying]."

American Brands, listed 79th on the 1984 Fortune 500 list, is most renowned for tobacco products that its American Tobacco Co. division manufactures, but it is a \$7 billion conglomerate with interests in insurance, whiskey, records, financial services, home products and, through Wilson Jones, office supplies. Wilson Jones sells equipment and supplies to office equipment dealers and distributors.

Wilson Jones formerly had a business computer division and through that division held membership in Adapso from April 1983 to February 1984, Adapso confirmed. An Adapso spokeswoman said the company

dropped its Adapso membership when it disbanded the computer division.

At the press conference last week, Adapso President Jerome L. Dreyer said, "Software piracy can no longer be considered an acceptable crime, with abusers having no fear of being caught" and that Adapso was acting as a representative of the software industry to protect software publishers from infringement of their copyrights and trademarks.

Marv Goldschmitt, vice-president for business development of Lotus Development Corp. and chairman of Adapso's Software Authorization Committee, said the lawsuit is a "last resort" for preventing piracy and is the least desirable tactic. He also said, "A majority of people really don't realize they are doing something wrong."

Adapso executive board member John Imlay, chairman of Management Science America, Inc., said, "Not everyone is a thief; we don't mean to insinuate that; not everyone knows there is such a thing as piracy."

Informational brochure

According to Adapso, 60,000 brochures detailing liabilities of software piracy and urging establishment of formal anti-piracy policies will be mailed to chief executive officers and corporate legal counsels around the country, as well as to the heads of colleges and educational institutes.

The intent of the lawsuit and the publicity campaign, according to Adapso, is to prompt U.S. corporations to recognize the legal liabilities of copyright and trademark infringements and to implement formal policies prohibiting employees from such practices.

"The mailing should have quite a positive impact [on top executives] and [should] let them know piracy is a major problem and could have a significant impact on their organization," Imlay said.

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NEWS

Appletalk links dorm micros to core of Dartmouth net

HANOVER, N.H. — A beta-test version of Apple Computer, Inc.'s Appletalk local-area network has proven to be the solution to Dartmouth College's need for a cost-effective means to link Apple Macintosh computers used by 1,200 students with the college's central computer network.

The Appletalk Personal Network, originally referred to as Applebus, will be officially unveiled at Apple's annual meeting Jan. 23. It will cost \$50 per computer and provide synchronous communication at 230.4K bit/sec for as many as 32 Macintoshes, according to Apple literature obtained by *Computerworld*.

At Dartmouth, though, the Appletalk network is not providing the traditional local-area network functions of sharing peripherals or information within an office or even a dormitory. Instead, Appletalk is used as a gateway to the college's own Kiewit Network (see story below), which connects most of the campus's offices and all of its dorm rooms with six Digital Equipment Corp. VAX-11 series minicomputers, two Prime Computer, Inc. minis — a Model 550 and a Model 750 — and two Honeywell, Inc. DPS 8/49 mainframes.

The students use the Kiewit Network for off-line storage, research and for most of their word processing tasks, according to Rich Brown, manager of special projects for Dartmouth's Kiewit Computational Cen-

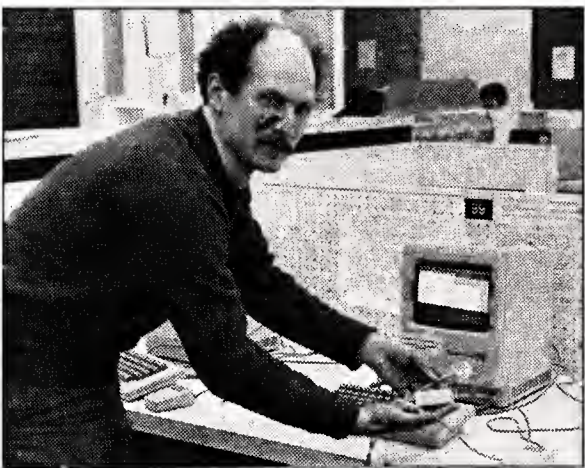
ter. They download their writing from the Kiewit Network's mainframe-based word processing system to one of several printer stations located around the campus, he said.

Appletalk's communications software resides within the Macintosh operating system. The network consists solely of a shielded, twisted-pair cable that connects to the Macintosh's serial port at one end and connects to a small junction box that encloses a transformer at the other end. Two output jacks on the junction box allow Appletalk cables to carry communications to the serial ports of other Macintoshes, peripheral devices or, in Dartmouth's case, the four-prong wall socket of the Kiewit Network.

Brown said Dartmouth has found Appletalk to be a cost-effective approach to networking the Macintosh. "There are a lot of people with 2M-bit networks [for sale]," he said. "The Macintosh needs one \$50 cable to tap into a [personal computer] network; everybody else needs an interface

card that starts at \$150 and up."

For Dartmouth, Appletalk's arrival was timely; the college had nearly required 1984's freshman class to purchase Macintosh computers, and 750 students, three-quarters of the new class, responded by buying the machines. This action left the school with a need to bring the Macintoshes



Brown demonstrates hardware used in Apple Computer, Inc., Appletalk

onto the Kiewit Network in a way that would be inexpensive and that would support broadband communications, Brown said.

Early last year, shortly after Dartmouth decided to support the Macintosh for students, the college began a research effort to develop a link between the Macintosh and the Kiewit Network. When the network staff saw the Macintosh network protocols in March 1984, however, it decided to go with the Apple network, especially because it promised to link a greater number of Macintoshes than they had thought was possible.

Brown said he has since found that Apple "did everything we were planning to do, probably with more foresight." The Appletalk network's minimal hardware was easy to install as well, he said. Because the college had already installed wall sockets for the network in each dorm room, all that was needed was to give the students the Appletalk hardware, a diskette of the college's own Dart Termi-

nal communications software and a demonstration of how to make the Kiewit Network connection.

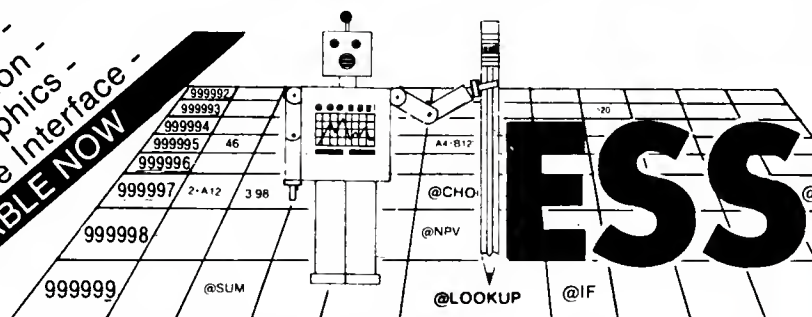
The students installed the hardware without a hitch, Brown said, using the Dart Terminal software to gain the special terminal emulation needed by the Kiewit Network. Faculty and staff, who own roughly 1,600 Macintoshes among themselves, are not using Applebus and, instead, tie into the Kiewit Network using Apple's Macterm terminal emulation software.

Brown said Dartmouth chose not to provide office-type communications functions for students because of security and for control over access to peripherals. Brown said the college someday is likely to provide high-quality printers to be shared by Appletalk users on each dorm floor.

The Appletalk network communicates using datagrams — messages that are passed from node to node without being slowed by repeated acknowledgements. The datagrams, Brown explained, provide the broadband communications support that Dartmouth needs to utilize eventually the system of buried coaxial cable that currently lies unused throughout the campus. The Kiewit Network is connected with twisted-pair leased lines that presently cost the college \$24,000 a year.

A potentially useful feature for the Dartmouth students that Appletalk lacks, Brown said, is electronic mail. Messages sent from one Kiewit Network user to another are now carried by a citizens band (CB) simulator running on one of the Honeywell mainframes. The chatter of the CB simulator users travels across campus to the mainframe and back — even if the users live on separate floors of the same dorm.

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Campus wired for easy access to expanse of system functions

HANOVER, N.H. — Though its buildings may seem more networked with ivy than with cable, the campus of Dartmouth College here is extensively wired in a data communications network that offers the power of several mainframes and minicomputers to the terminals and personal computers of its faculty and staff.

The school's Kiewit Network, named to honor the donation of a former student, links six Digital Equipment Corp. VAX-11 series minicomputers, two Prime Computer, Inc. minis — Models 550 and 750 — and two Honeywell, Inc. DPS8/49 mainframes with roughly 2,800 Apple Computer, Inc. Macintosh personal computers and 1,500 terminals of various brands. Users rely on the network for word processing, programming and scholastic research, the latter function aided by on-line access to the campus library's holdings catalog.

Network users are connected to

the computer of their choice by simply entering the machine's functional name on their screens. They are connected to their chosen host system via one of 80 New England Digital Corp. (NED) minicomputers scattered around the campus, explained Rich Brown, special projects manager for the college's Kiewit Computational Center.

The NED minis, he said, do no processing and act only as port switchers, routing communications to the appropriate host over an X.25 data link, and as terminal concentrators. The computers, he added, are usually sold by NED as part of the company's \$20,000 music synthesizer.

Students pay nothing to use the network with their Macintoshes, while terminal users pay only \$15 per month.

The free or low-cost access for users, Brown said, shows the network is meeting Dartmouth's objective of providing "pretty good computing for cheap."



NEWS

Students spell success for firm's program needs

By David Olmos
CW Staff

JOPLIN, Mo. — Several years ago, a trucking firm needed an applications program that would record information about lost cargos and accident claims. The firm's busy DP shop, however, could not spare the people to write the program, and experienced contract programmers were scarce in southwestern Missouri.

Jim Gray, an assistant professor at nearby Missouri Southern State College and a consultant for the trucking company, Contract Freighters, Inc. (CFI), stepped in with a suggestion: Why not give the job to computer science students at the college?

Gray explained that, while attending a CFI management meeting, he "swallowed real hard" and submitted a proposal stating "Christmas vacation is coming up, and if you'll give us that project, we'll design it."

Carl Duncan, vice-president of information systems at CFI, was not sold on the idea at first. "I wasn't so sure it would work, using students who were inexperienced and putting them on a pretty important job," he recalled.

But because the company desperately needed such a program, and because he had confidence in Gray's judgment, Duncan decided to give the students a try. The experiment was a success.

Enthusiasm overrode everything

"The students were so enthusiastic about learning everything they could and [about] doing a superior job, that it really worked out well," he said. "Their enthusiasm just overrode everything else."

Today, the trucking company employs eight students from Missouri Southern and plans to hire more. The accident and cargo loss applications program the students helped write has become an important tool in enabling the firm to manage its fleet of 500 trucks and 800 trailers.

The students have also helped write an inventory program that keeps track of thousands of vehicles' tires. It is used to measure tire wear, to schedule inspections and to prevent theft.

"I have always believed that the student labor force is one of the largest untapped areas in the computer industry," Gray asserted.

Gray is a computer science instructor who, for 10 years, managed the college's computer center using student help exclusively. With the blessing and support of the college, Gray established the internship program with CFI two years ago.

The internship program is popular among computer science students at Missouri Southern. Students are selected as interns based on their grades, personal qualifications and successful completion of a programming course in RPG III — the programming language for CFI's two

IBM System/38 minicomputers.

The students must be willing to work at CFI 20 hours a week for two years or until they graduate. The college awards three course credits to each intern.

Although they are paid roughly one-third the going rate for entry-level programmers in the Joplin area, the students agree that the experience is worth it.

"It's an excellent opportunity to get experience that is not available at the college," according to intern Paul Fenstermacher. "It involves programming real applications" rather than merely academic ones, he said. Another intern, LaVerne Stansberry, said she is pleased to have a job while in school and added, "I think this is definitely going to give us an edge" in the job market. Todd Thelen, one of the first two students to work at CFI, has already received a couple of job offers, which he attributes to his experience at the trucking firm. Some of the students have been hired at CFI after graduation.

The software CFI uses to run its trucking operation is all custom-written, Duncan said. The company has also gone into the business of selling applications packages to other trucking firms that then modify them to fit their own needs.

During a recent semester break, several students worked at CFI software client companies helping to modify programs. The students said they valued the chance to work with other clients and gain experience with other computer systems.

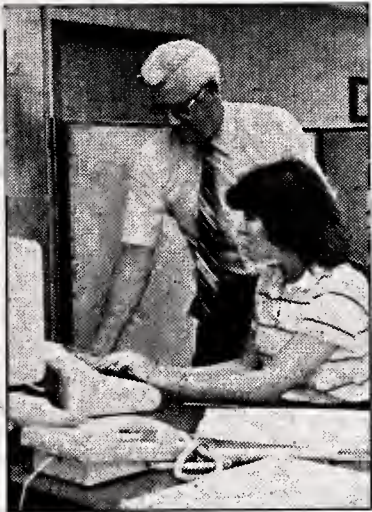
"They work with users in designing systems, laying out the files and designing the screens — all the way until the user says, 'That's what I want,'" Gray said.

Duncan acknowledged that, without the students, he would have to pay more to hire experienced programmers — that is, if he could find them. But he asserted that the financial considerations are not as important as the flexibility the students provide, which allows him to respond to changes in his DP shop's work load.

"Most DP shops have a fluctuating requirement for staff," he noted. "They have a heavy load for a while, and then it drops off." Without the students, he said, projects would likely have been delayed.

Gray said he is bothered by the perception of some business people that college students are not worth hiring until they graduate. "They seem to have the idea that the college student can't perform until the day he walks across that stage and gets a diploma. [Additionally] the student faces the problem of the employer who wants [him] to have two years of experience."

He said he has found that it is rewarding to work with students. "These kids are eager, and they'll climb a mountain for you."



Pam Green and Carl Duncan review the cargo loss system.

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NEWS

COBOL from page 1

disk drives and Microsoft's MS-DOS 2.0 operating system.

The U.S. government's General Services Administration (GSA) Federal Software Testing Center found that Microsoft's Cobol has a high level of compliance with the Ansi 1974 Level 2 Cobol standard.

Microsoft Cobol costs \$700 from Microsoft, Box 97200, 10700 Northrup Way, Bellevue, Wash. 98009.

Micro Focus' Professional Cobol reportedly consists of a GSA-certified High-Level Ansi '74 Cobol syntax checker and an Intel Corp. 8086 microprocessor native-code-generating compiler. It is said to contain a full screen Cobol source code editor that can be used as a documentation development tool and a forms screen painting tool that generates source

”

The GSA Federal Software Testing Center found that Microsoft's Cobol has a high level of compliance with the Ansi 1974 Level 2 Cobol standard.

code that allows a programmer to paint an interactive display as it will appear to an end user.

Animator, a source-level debugging tool, allows a programmer to control the flow of execution, monitor and modify data base values and

perform "what-if" program analysis, the vendor said.

Professional Cobol contains other programming tools:

- A library tool that reportedly allows a programmer to group any number of program and data files into one library.

- A run tool with which the programmer, after a syntax check or full compiling, can execute one or more independent programs and view them as an end user would, according to the vendor.

- A build tool that combines programs, library files, application support modules and a runtime system into a stand-alone, executable module.

Professional Cobol costs \$3,000 from Micro Focus, located in Suite 235, 1860 Embarcadero Road, Palo Alto, Calif. 94303.



CW photo by M. Betts
Computer catalog terminals in space once reserved for index card cabinets.

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**LIBRARY** from page 1

library has cataloged new acquisitions in its machine-readable cataloging (Marc) computer system and recently the library converted its 1979 list of 5.5 million books into computer format to cover pre-1968 items, in what is called the pre-Marc system.

Consequently, a researcher looking for English-language books on Shakespeare, for example, now could use a computer terminal to find at least 90% of the library books on the subject, Kimball said, conceding that a few very old books and papers do not yet show up in the computer files.

"From now to the time that we dispense with the cards, we will be developing procedures to be sure that everything that's in the card catalog shows up in the computer file," he added.

Automation of all the library's collections will be an arduous and continuing process, Kimball emphasized. "We are making arrangements to continue creating machine-readable records for all of the library's catalogs for all formats, not just monographs," he said. "This will include serials, periodicals, maps, music and photo records, manuscripts—any type of library material."

'A long way to go'

The library has about 71 million items now that could be cataloged. "We're talking now about having only cataloged about 7.5 million books in machine-readable form, so we've got a long way to go," Kimball said.

To handle the huge data base, he added, the library will replace its two IBM 3033 mainframes in the next few months "with whatever is equivalent to IBM's best computer now," because the data files simply require faster and more powerful processors. "The [teleprocessing monitor] is CICS, so in order not to have to redo all of the files and software, the request for new hardware [requires it] to support CICS," he added.

The automation projects will continue as the library undergoes a major renovation, to be completed by 1992. By January 1987, Kimball explained, the number of computer terminals will increase to between 75 and 100. The wood cabinets, with their elaborate and historic carvings, will survive as part of the high-tech catalog, Kimball said, by way of some artful carpentry work.

NEWS

Amdahl extends communications processor line

By Jeffry Beeler
CW West Coast Bureau

SUNNYVALE, Calif. — Amdahl Corp. last week expanded its communications product family with the introduction of a front-end processor that reportedly helps users exploit their untapped bandwidths by multiplexing data, voice and video signals over one high-speed transmission resource.

Amdahl's 4705T made its debut on the same day as an enhanced version of the company's existing 4705E communications processor. Amdahl claimed the 4705T has more than twice the performance of its IBM counterpart, the 3705 Model 2, and at a 35% price savings.

The enhancements expand by one-third the number of full- and half-duplex lines that can be attached to one 4705E scanner, according to Sam Ezekiel, an Amdahl product marketing manager. The machine's expanded version is also said to support up to six host CPU connections, compared with four for its predecessor. By improving the connectivity of the 4705E's scanners, Amdahl has extended the useful life of the processor's base model, Ezekiel said.

Like the enhanced 4705E, the 4705T starts with a base cabinet and then permits customers to enlarge their transmission capacity through the addition of expansion modules. Packaged with four scanners and

four channel adapters, the unit communicates with host processors at up to 64K bit/sec and supports 160 half-duplex lines running as fast as 9.6K bit/sec.

Each of the processor's two expansion cabinets, meanwhile, holds another 96 such links, for a reported total system capacity of 352 half-duplex lines.

Rounding out the 4705T is a high-speed attachment cabinet that is said to hold simultaneously as many as 44 data, video or voice lines ranging in speed from 4.8K to 768K bit/sec. This last hardware module supports simultaneous, two-way communications between distant points and, by allowing the 44 lines to share the same high-speed transmission facility, maximizes the efficiency with which customers can use their bandwidths, Ezekiel said.

Said to outperform rivals

Capable of operating in a Systems Network Architecture environment and compatible with IBM 3705 software, the 4705T reportedly outperforms both its Amdahl predecessors and its IBM rivals. In an Amdahl benchmark test involving 100 bisynchronous 3270 lines operating at 9.6K bit/sec, the 4705T provided 2.4 times greater throughput than the 3705-2 and a 30% performance edge

over the 4705, Amdahl sources said.

Included in the processor's features is an assortment of line interfaces to bisynchronous, Synchronous Data Link Control, X.25, X.21 and start/stop communications protocols.

In addition, the 4705T provides as standard equipment a network management console that allows resources in a T1 data switch or other high-speed transmission facility to be allocated dynamically in response to user demands, Ezekiel said.

Increased lines delay expansion

With its high-speed attachment module, the 4705T qualifies as an enhanced version of the 4705E, which now supports 64 half-duplex or 32 full-duplex lines per scanner, he added. Prior to its latest upgrade, the 4705E accepted 48 half-duplex or 24 full-duplex lines per scanner. The purported improvement in scanner capacity is said to increase by 33% the number of lines a 4705E can accommodate before expansion is necessary.

Field-upgradable to a 4705T, the 4705E, price starting at \$36,000, will begin shipping in volume during the first quarter. So, too, will the 4705T, whose purchase price starts at \$42,000.

Amdahl is located at 1250 E. Arques Ave., Sunnyvale, Calif. 94088.

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NEWS

GM, large users boosting drive to adopt OSI standards

Seven-layer standard's presence in office DP equipment still lagging

By Bryan Wilkins
CW Washington Bureau

WASHINGTON, D.C. — A group of 400 users turned out last week to attend the Manufacturing Automation Protocol (MAP) users group meeting, at which adoption of the International Standards Organization's (ISO) seven-layer open systems interconnection (OSI) standard was the principal goal.

Conversely, a parallel effort to promote OSI in the office place appears to be moving along at a slower speed, as evidenced by the fact that no users group is pushing the adoption of the standards for incorporation in vendors' data processing equipment.

This week, however, Boeing Computer Services Co. of Vienna, Va., intends to announce its plans to support the OSI standards for the office place at the opening of the Infomart computer retailing center in Dallas, the company said.

Meanwhile, MAP users, who take

At the fourth, or transport, layer, an ISO international standard has been promulgated that specifies a Class IV protocol, but still at issue is the use of other protocols to enable real-time communications, Workman added.

At the fifth, or session, layer, where streams of data are managed, concerns such as the communication of data among applications programs within a MAP network, file transfer and access management in a two-way simultaneous transfer system are still at issue despite the promulgation of an ISO kernel system standard.

The sixth, or presentation, layer

and the seventh, or applications, layer are the two areas where vendors are applying their own interpretations to the implementation of the OSI model, according to Workman.

Obstacles to be overcome

From a user's point of view, the value of OSI products will not be realized until several significant obstacles are overcome, the GM representative said. Among them, he noted, were the development of a language for communicating OSI functions within a network. "We need to work on the components of a message structure — the syntax, semantics

and grammar of a message," he said.

Outlining the remaining issues that need to be addressed before OSI becomes a reality, Workman pointed to real-time processing and the connection of MAP nets to wider area networks in order to link, for example, the factory floor to the accounting or the receivables department.

One user asked how users would be able to link OSI-supported products that internally interface between one layer and another in different manners.

In response, Workman demurred, saying, "There is a wealth of interfaces that you [the user] can use."

"

From a user's point of view, the value of OSI products will not be realized until several significant obstacles are overcome.

their name from a MAP protocol developed for integrating factory automation systems at General Motors Corp., heard officials from the auto manufacturer describe GM's efforts to implement protocol standards that permit sophisticated user manipulation of data over incompatible systems that are interconnected.

GM said it is pushing for adoption of OSI protocols to integrate factory floor processes because its costs have become inflated by building vendor-specific hardware-software interfaces, which GM said raises its costs by 15% to 35% annually.

The National Bureau of Standards (NBS) last year opened a government-industry push to implement the ISO interface protocols, separating the work into two groups focusing on factory systems and office systems, respectively. A demonstration was held at last year's National Computer Conference in Las Vegas.

NBS has set up a research and test facility to promote the protocols that it hoped would be incorporated into vendor products. Last week, Gary Workman, a GM representative who has been working on the MAP implementation, remarked to the users group that numerous issues — from the third, or network, layer up to the seventh, or application, layer — are still up in the air.

A draft international standard has been formulated for the network layer, which routes information between and within networks. However, addressing schemes and routing algorithms to connect one MAP network to a wide-area network are issues still undecided, Workman said.

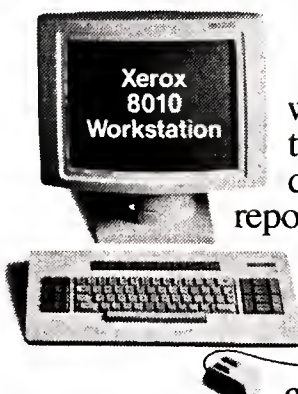
A day in the life

Outlook Report, June 1986
(Note: Insert line chart here with Total US Commercial By Month data.)

is mixed for the near-term. However, there could be an upswing in the price if the oversold condition is corrected in the next 6-8 weeks. Due to the biological and seasonal factors, the size of the November-December unit crop is historically smaller than the preceding August-September crops. This could tend to adjust the condition of the market during the specified time frame. So even though unit levels are above those of a year ago, a projected, but a seasonal month-to-month decline should afford a unit price rally during the next two months.

Let us here provide some background that will serve to more accurately explain the situation. The largest number of units are produced in the corn belt. (Note: Figure 4 should be inserted as close to this sentence as possible.) due to the easy availability of corn. Due to northern weather conditions, the optimum time for units to be produced is in the fall so that a weather factor can favor the new methods of production capabilities. This could also mean that, in addition, available time is a critical factor that will require precise definition — both risks and opportunities. This time factor also gives producers ample leeway in attending to their production operations since major work has not begun as yet. Since it takes approximately six months for new units to be produced, the spring market — the largest of the year — generally needs to be defined during the fall of any given year. Since producers appeared to be somewhat late in expansion practices last year, some analysts assumed that market conditions are on a downswing; i.e., history repeating itself with a worsening factor included. Market and production analysis, however, indicates the opposite could be true in 1986. If one considers the long-range trend, it is apparent that increased efficiencies in production coupled with the current positive crop status would clearly point to an upswing in output and marketability.

Los Angeles, Monday, 8:00 A.M. PST. Text of document is created on Xerox 860 Information Processor and communicated on Ethernet network to Chicago.

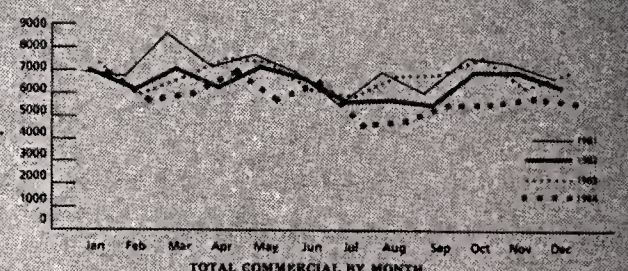


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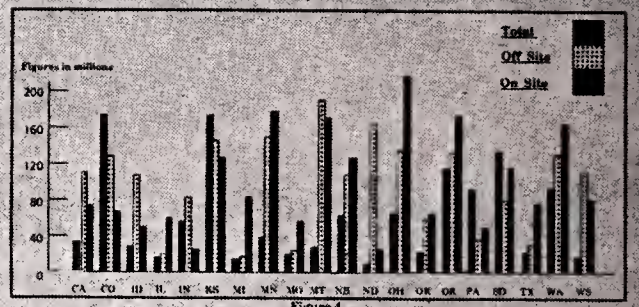
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is mixed for the near-term. However, there could be an upswing in the price if the oversold condition is corrected in the next 6-8 weeks. Due to the biological and seasonal factors, the size of the November-December unit crop is historically smaller than the preceding August-September crops. This could tend to adjust the condition of the market during the specified time frame. So even though unit levels are above those of a year ago, a projected, but a seasonal month-to-month decline could afford a potentially high and

hoped-for unit price rally during the next two months. Let us here provide some background that will serve to more accurately explain the situation. The largest number of units are produced in the corn belt, due to the easy availability of corn. Due to northern weather conditions, the optimum time for units to be produced is in the fall so that a weather factor can favor the new methods of production capabilities. This could also mean that, in addition, available time is a high priority for production utilization. It



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NEWS

Micro vendors putting users' product queries on hold

By Paul Korzeniowski
CW Staff

"I will have to forward your call to the technical support group," said a customer support representative at Ashton-Tate, a Culver City, Calif., microcomputer software vendor. "You may be put on hold for half an hour."

A wait of such length is common for users with a question that a corporate microcomputer support staff or a computer dealer cannot answer, vendors and microcomputer users told *Computerworld*.

"The only time a company receives prompt answers from a vendor is when it is deciding which package to purchase," noted Mark Tramonte,

an analyst at Conn.-based Hartford Casualty Insurance Co. "During the evaluation process, a vendor makes sure that questions are swiftly answered. Once a purchase decision is made, things change, and it takes a longer time to receive an answer."

This disparity arises more out of inexperience than deceit, according to Tramonte. "Vendors are well intentioned and want to provide support, but they just don't seem to know how to do it," he said.

Vendors listed four factors that prevent them from transforming their intentions into reality:

- Users' systems consist of wares from numerous sources, so companies are forced to support other ven-

dors' products as well as their own.

- Users would rather call technical support than read a manual.

- User expertise and needs greatly vary.

- A good support employee must have technical and communication skills, and this combination is hard to find.

During a two-hour period, Alpha Software Corp.'s support staff received as many questions concerning hardware as it did for Alpha's software. "We spend a great deal of time telling users how to configure a system — how to attach a printer or hard disk to a microcomputer," Brad Fenn, manager of customer and technical support at Alpha, located in

Burlington, Mass., noted. "Our staff has a thorough knowledge of our products, but locating problems with a certain disk drive or a printer can be time consuming."

User manuals

Often, these questions are answered in a user manual. "Some people are more comfortable picking up a telephone than leafing through a user manual for an answer," noted Bob Gafford, vice-president of documentation and product support at Ashton-Tate.

Usually, it is the first-time user who doesn't consult the manual, vendors noted. "First-time users often need hand-holding, and they ask a range of questions such as 'Which printer should I buy?' and 'How good is XYZ company's spreadsheet?'" Fenn said.

Seldom do these types of calls come from a corporate user. "We know that users may have difficulty reaching a vendor's technical support staff so we try to provide as much support as possible," Tramonte maintained. "This situation is good for us and for the vendor."

Despite an in-depth knowledge of a package, a corporate staff often experiences problems that it cannot solve. "There are approximately three or four times a day when we have to call a vendor or a computer dealer for a solution to a problem," Tramonte said.

Technical problems

These problems tend to be technical, and vendors usually are not as well equipped to answer them as they are to answer first-time user questions. "When we hire a support person, we look for communication skills as well as technical skills," Fenn said.

"The person has to be able to guide the person through a problem as well as understand the technology. Our technical support people have programming experience, but they are not programmers. Users should realize that there may be questions that we can't answer."

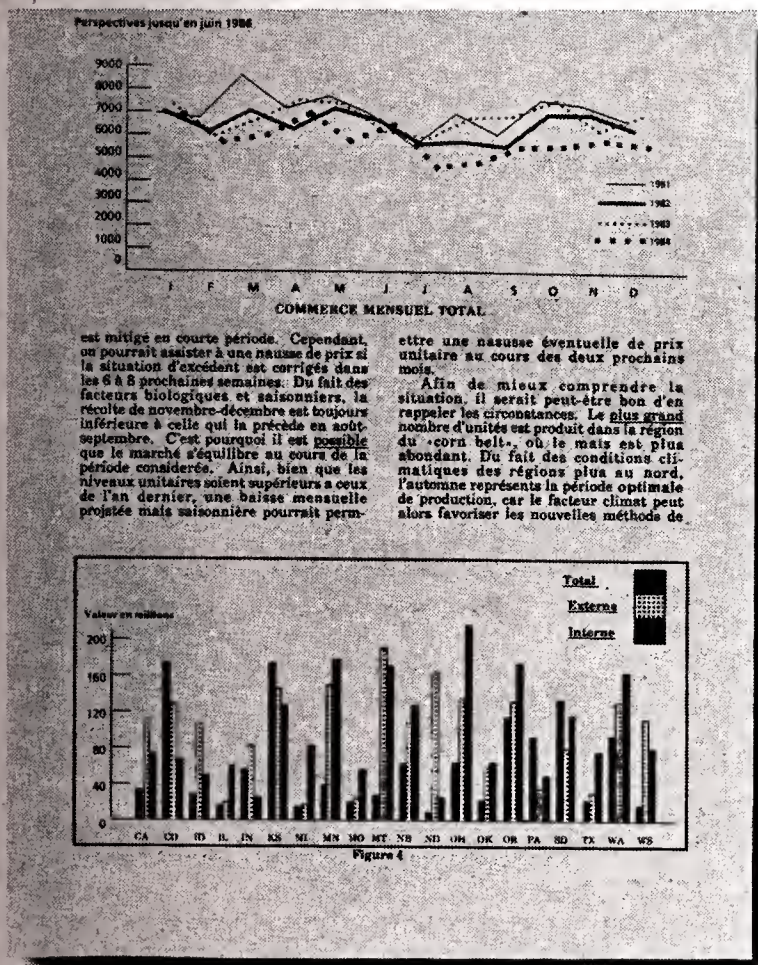
When Fenn's group is unable to answer a question, it consults a programmer who designed the package. "Three or four times a day, we have a problem that we may not be able to solve," the support manager said. Fenn claimed that most technical problems are solved in one day.

Vendors generally realize the problems this delay may cause a corporate user, and there are signs they are attempting to provide better and faster support. In December, Ashton-Tate hired Gafford as vice-president for support and documentation. His primary responsibility is to improve Ashton-Tate's support response time and quality. Ashton-Tate claimed it is the first microcomputer software company to hire a vice-president of support.

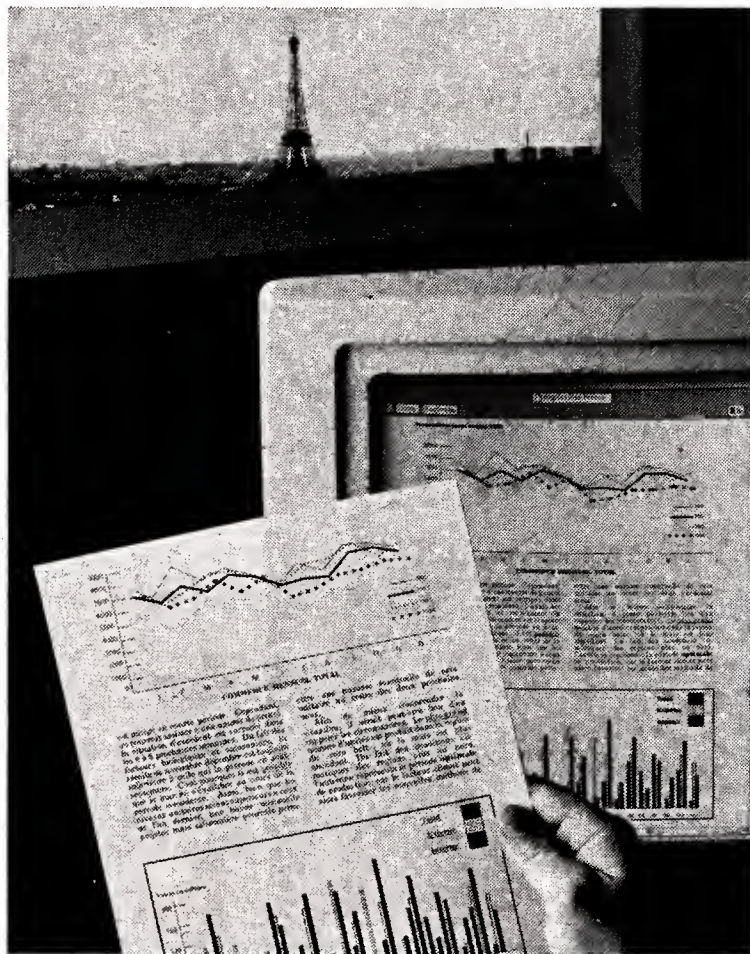
The result may be that Ashton-Tate will divide support into two groups: corporate and single user. "There are two groups of users, and each requires a different type of support," Gafford said. "If we do not divide our group, we may screen telephone calls and route technical questions to those best able to answer them and nontechnical questions to other support personnel."

XEROX

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NEWS

Patent disputes, hacking major DP law issues in '85

Need seen for lawyers to have better understanding of technology

By James Connolly
CW Staff

There may be those who picture a computer lawyer as a robot standing before a black-robed judge and saying, "Beep! I object!"

But throughout the U.S., almost every major law firm now offers some degree of specialization in computer law, an area that is constantly evolving and yet is little more than corporate, tax, criminal and copyright law with the names changed to confuse the innocent.

More than 1,000 lawyers now belong to regional and national computer law organizations. Some of those attorneys, in a survey eliciting their concerns and observations of trends in computer law, listed hacking, patent disputes, privacy, warranties and product liabilities among their concerns.

But the self-proclaimed inventor of computer law, Boston attorney Roy Freed, tempered all of their comments by noting, "There's no such thing as computer law. Actually, computers are merely the vanguard of advanced technology." Freed added that the first thing a lawyer and a client should realize is that computers impact all fields of law — corporate, copyright, labor, business and criminal — and that lawyers must understand the technology so they can apply the appropriate law.

Freed, who has been involved with computer law for 24 years and is the founder of the Computer Law Association, said key issues include recognizing a computer program as a work of authorship, just like a book, and the idea that "computer equipment is equipment just like any other equipment."

Hacking, whether it involves theft by employees or vandalism by strangers, was one issue cited by Peter Marx, chairman of the New England Law Forum. "People are going to be appalled to see so many people getting off on technicalities. It's going to be a field day for good lawyers. The result will probably be that in 1985 we will see the cases that will generate the anger, so that in 1986, there will be all kinds of new legislation," Marx said.

Marx, who is vice-president and general counsel for Chase Econometrics/Interactive Data Corp., warned that corporations should be prepared for more vandalism, taking such forms as the recent harassment of a

Newsweek reporter who offended a group of hackers. The hackers, apparently angered by an article the reporter wrote, broke into his credit files, pulled his credit card codes and passed them around.

Marx noted that with so many conflicting theft and computer trespassing laws in individual states, it remains unclear how to prosecute

cases, for example, like that of a California company that penetrates its Massachusetts competitor's data base and sends the data to its Michigan branch office. He added that a hot issue that lawyers will be addressing is the question of who owns the knowledge in an employee's head, as in the case of a program-

mer or designer who uses on-the-job experience to develop a product on his own time, even where no trade secrets are involved.

One result of these and other issues will be the growth of a computer-related insurance business, with vendors and users taking on special insurance for protection against suits

for libel, contract disputes and loss of trade secrets.

While Marx called for more laws, Michael Scott, director of the Center for Computer Law in Manhattan Beach, Calif., said existing laws are sufficient to protect against hackers. "Most of the activity is going to be taken care of by existing statutes or modified statutes. The problem is that Congress doesn't understand what is going on. They are leaving it up to federal prosecutors to decide who is going to be hit with a federal indictment for a relatively minor offense," Scott said.

He warned that antihacker crackdowns could create disrespect for the law, particularly if the focus is on "victimless crimes."

But an area that is due for more structure is that of warranties, Scott said. "Most of the problems that we've had have been because there are not enough cases to guide us. Everyone is speculating. Until we have more cases, we are not going to know what the boundaries are," he noted. He added that while most states have long had common laws addressing fraud, lawyers representing vendors and users should be careful in drafting warranties, addressing such issues as in what state a suit can be litigated.

Scott and Marx agreed that the
See LAW page 15

"People are going to be appalled to see so many people getting off on technicalities. It's going to be a field day for lawyers."

— Peter Marx,
Chase Econometrics/Interactive Data Corp.

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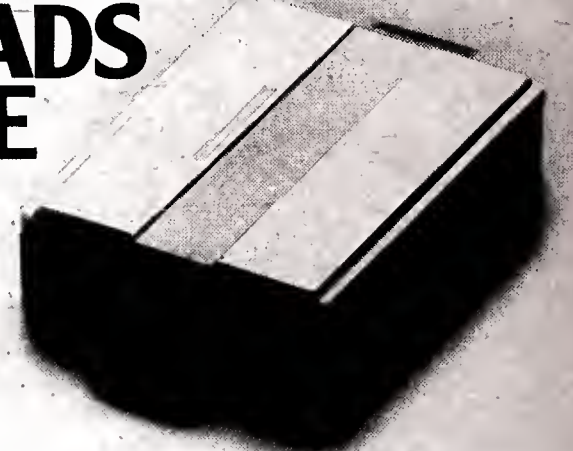


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NEWS

WASHINGTON
UPDATEMitch Betts
CW Washington CorrespondentComprehensive MIS urged
for tracking EPA Superfund

WASHINGTON, D.C. — The U.S. Environmental Protection Agency (EPA) should consider developing comprehensive MIS to track enforcement of the Superfund program, which requires companies to help clean up their hazardous chemical dump sites, according to the General Accounting Office (GAO).

In a recent report to the U.S. Congress, GAO maintained that EPA headquarters and regional offices al-

ready have individual tracking systems in use for certain types of enforcement cases.

However, GAO reported that if the number of Superfund enforcement cases continues to rise as projected, it will become increasingly beneficial for EPA program managers to maintain more comprehensive tracking information.

GAO said the comprehensive system would help the agency answer questions such as "How long are different steps in the enforcement process taking?" and "Are the time frames that have been set for the process being met?"

The system would track the complex enforcement cases through the court proceedings, which can involve hundreds of participants and documents and take several years to complete.

Proposed U.S. credit agency
would use automated system

WASHINGTON, D.C. — The Reagan administration is considering a plan to create a federal credit agency within the U.S. Department of the Treasury that would enlist the help of computers to collect delinquent government loans, a spokesman said last week.

The computer system would be modeled after the one the Internal Revenue Service uses to collect back taxes.

IRS employees use computer terminals to locate priority cases, and the computer dials the telephone number of the delinquent taxpayer. (The IRS system features an IBM 4341 processor, a Galaxy Automatic Call Distributor by Rockwell Collins

Co. of Chicago and custom software by Arthur Andersen & Co. of Chicago.)

The Debt Collection Act of 1982 required 20 federal lending agencies to improve their debt collection procedures, but the Office of Management and Budget (OMB) is proposing a more centralized approach to debt collection.

OMB estimates that 20% of government loans are overdue or in default, amounting to approximately \$23 billion.

In response to the proposal for a central credit management agency, OMB spokesman Steve Tupper said, "We're currently looking at that as an option for clarifying the federal role in debt collection. Congress and some agencies may have some questions about it, but we think it's the way to go."

LAW from page 14

ability to copyright software is a dead issue, with the courts in recent years affirming that software should be protected by copyright.

John Lautsch, chairman of the American Bar Association Computer Law Division, added that the next year will see further clarification of patent law as it applies to software, drawing on Apple Computer, Inc.'s victory over Franklin Computers Corp. [CW, Jan. 16, 1984]. "People will begin to realize that protection of software is more realistically achieved through technical protection rather than through the law," Lautsch said.

Lautsch also cited privacy, a "perennial issue," as a hot legal topic for 1985 because the cost of computer storage is plummeting and capacities are rising. He noted that a personal computer 40M-byte hard disk in someone's home or office can hold dossiers on 50,000 people. With no public clamor for action on the privacy issue, Lautsch said he looks for elected officials to take an initiative to protect the individual.

A new area of law is emerging, that of computer-related product liability, according to Lautsch. While past computer law has concentrated on the ownership and performance of the computer, this new focus will be damage and personal injuries caused by computer-driven devices. Lautsch said that with \$2 microchips controlling key functions in products ranging from toasters to jetliners, lawyers will sue manufacturers and programmers based on programming flaws that cause tragedies.

But Hampton, N.H., attorney Thomas K. Christo said such product liability cases are three to five years away. "We are really just touching the fringe of real computer-controlled equipment now," he noted.

Christo said a more likely trend for 1985 will be class action suits by users. He observed that personal computer users do not have the resources for a long court battle with a manufacturer, but that groups of users, representing everyone who owns a defective machine, can better wage such a battle. Christo also said that the concept of a computer vendor being responsible for equipment and software is now well entrenched. Because of that, vendors and users are now more careful, he said. That recognition has led to users relying on lawyers from the start of the purchase process.

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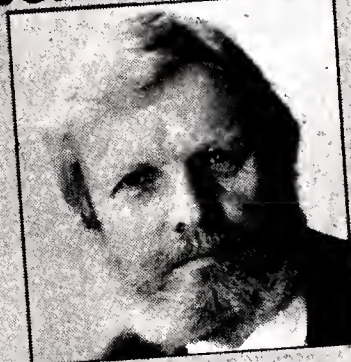
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WANG

NEWS

Home computing boom encourages zoning law update

By James Connolly
CW Staff

CHICAGO — The threat of \$100-per-day fines apparently has passed for a Chicago couple and other computer users here following a fight that lasted more than a year.

The computer users, including free-lance programmers and writers, and other city residents active in cottage industries such as knitting and sewing have sought to change a 28-year-old zoning ordinance that bars any money-making business in homes in residential neighborhoods.

While the ordinance remains on the books, one of the programmers and the city's acting zoning administrator agreed last week that the law

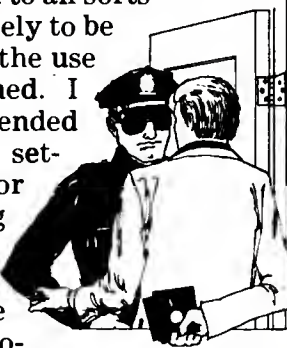
should be changed and that, even as written, it should not prohibit programming in a person's own home.

"The law is vague, open to all sorts of interpretation and is likely to be changed at least as far as the use of computers is concerned. I think it was originally intended to prevent doctors from setting up X-ray equipment or dentists [from] starting their practices in their homes. But it was passed the year before Sputnik 1 went up, and nobody imagined people having computers in their homes at that time," said Leah O'Connor, a former physics teacher who began writing computer

games at home five years ago.

O'Connor, who uses a variety of inexpensive home computers, and her husband, Patrick, who uses a Tandy Corp. Model 2000 to write magazine articles, were served with a cease-and-desist order after a city inspector received an anonymous tip last year that the O'Connors were operating a business in their home.

Acting zoning administrator Maurice Parrish, who was not involved with the original complaint, said the O'Connor file indicates that the inspector found a number of people working in the



O'Connor's basement, although Leah denies ever having had anyone programming for her.

No employees

Parrish told Leah that as long as she had no employees, she could continue programming.

He also said, "We're working on language to amend the ordinance so it will take into account the new technologies. We have recently gathered background information on other ordinances in other communities that have had amendments to permit these and other operations."

"We're not only talking about high-tech here but all of the new cottage industries, he added."

Parrish said that he has heard unofficial estimates of the number of home-based computer businesses ranging to several million nationwide and that numerous communities, most in the Boston and San Francisco areas, have updated their zoning laws in light of the home computer boom.

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Computer law program to run in 24 cities

NEW YORK — The Practising Law Institute will hold a one-day program titled "Introduction to Computer Law" on Feb. 26, and the program will be broadcast live to 24 cities located in the Eastern and Central time zones.

The program is intended to provide a legal foundation in the acquisition and use of computer goods and services.

The program begins with an introduction to computer terminology for lawyers, including definitions of hardware and software.

Other topics to be discussed include contracting for computer hardware, software and services; litigating computer disputes, such as warranty and negligence liability; federal taxation of computer goods and services; and computer software protection, including the developing body of law in copyright and trade secrets.

Daniel T. Brooks of Computer Law Advisers of Springfield, Va., will chair the seminar. The faculty includes Donald I. Baker of Sutherland, Asbill & Brennan of Washington, D.C.; Michael W. Berwind of Gaston Snow & Ely Bartlett of San Francisco; and Morton D. Goldberg of Schwab, Goldberg, Price & Dannay of New York.

The fee for the seminar, including course handbook, is \$95. Individual copies of the handbook may be purchased separately for \$35. The program is being conducted live at the J. C. Penney Building in New York, but the sponsor discouraged interested persons from attending the live event.

More information on the program as well as viewing site locations are available from Practising Law Institute, located at 810 Seventh Ave., New York, N.Y. 10019.



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For more complete information, get in touch with your AT&T Information Systems Account Executive.

WHEN YOU'VE GOT TO BE RIGHT.



NEWS

Office-based work, micros top preferences in OA poll

BILLERICA, Mass. — Given a \$10,000 windfall, office professionals would rather purchase personal computers than hire personal assistants, and given the choice of working at home or in the office, they would elect the office. So said a majority of respondents to a recent national survey.

Forty-one percent of the knowledge workers polled would buy computers if their companies said they could spend up to \$10,000 to increase productivity at work, and another 24% would add to their existing computers' capacities in some way. Only 13% would use the money to add a staff member, said respondents to "Office Automation and the Work-

place: A National Survey of Knowledge Workers," sponsored by Honeywell Technalysis for Honeywell, Inc.'s Office Management Systems Division.

Fifty-six percent of the surveyed knowledge workers said that, even if telecommunications technology made it possible to work at home, they would continue to go to the office every day. Another 36% said they would like to work part-time at home and part-time in the office; only 7% said they would opt to work exclusively at home, the study found.

Preferences for home-based work vary according to sex, age and income, the survey showed. While 51% of female respondents were willing to

divide their time equally between home and office, only 32% of the men surveyed would choose to do so. The preference for working exclusively in a traditional office environment increases with age, the survey showed. While half of the workers between the ages of 18 and 29 would opt for a 50-50 home-office split, only one-third of those between the ages of 40 and 59 would do so. Fifty-seven percent of knowledge workers who earn up to \$25,000, 47% of those who earn up to \$35,000 and only 27% of those who earn more than \$55,000 expressed a preference for working part-time at home, the study found.

Public Attitudes of New York, a research firm, polled approximately

100 professionals and managers of large corporations in each of seven functional categories — design and analysis, finance, legal, marketing, personnel and purchasing and operations management — for a total of 701 respondents.

Three-quarters of the respondents have word processing available to them daily, 68% have a computer terminal with which to work and a little more than half said they have a personal computer to use daily. Of those who have these technologies available to them, 95% use them, the study showed.

Majority interested in technology

Among the one-quarter of polled workers who do not have access to computers, the majority (71%) is either "very" or "somewhat" interested in using the technology, the survey said. Three out of four said they thought office automation technologies were "very" or "somewhat" easy to learn, with less than 1% claiming that learning to do their jobs on computers was "very difficult," the study said.

Approximately seven out of 10 respondents considered word processors and computers "very useful," whereas fewer than four out of 10 people surveyed said they felt that way about technologies like electronic mail and teleconferencing.

Eight out of 10 respondents disagreed with the statement, "Your company is more concerned about adding new machines and new technology than it is about the workers who will have to use the machines," the survey showed. The majority of the respondents (68%) said they felt that their companies had realistic expectations about what can be done with office computer systems, and 75% of those polled said their companies solicited their opinions about what type of equipment to purchase.

Honeywell Technalysis is a research-based program that examines the impact of applied technology on industrial, commercial and residential areas in terms of energy, cost and productivity savings, and it reports on emerging technologies.

The survey is available at no cost from Honeywell, Office Management Systems Division, 300 Concord Road, Billerica, Mass. 01821.

Lotus on a VAX?

dBASE II on a VAX?

Friday! on a Micro VAX?

Condor on a PDP-11?

PFS:File on a PRO?

Personal Pearl on a VAX?

QuickCode on a Micro VAX?

Spellbinder on a VAX?

WordStar on an MV/10000?

R:base 4000 on a VAX?

Multiplan on a PDP-11?

PL/M on a VAX?

SuperCalc 3 on a PRO?

T/Maker Integrated on a VAX?

MS BASIC on a Micro VAX?

Milestone on a PDP-11?

Palantir on a PDP-11?

SpellStar on a PRO?

MailMerge on a PDP-11?

PMS II on a VAX?

dBASE II on a PDP-11?

Lotus 1-2-3 on a PDP-11?

Open Access on a PRO?

MS FORTRAN on a VAX?

Condor on an MV/10000?

Multiplan on a PDP-11?

WordStar on a VAX?

SuperCalc 2 on an Eclipse?

PertMaster on a PRO?

Palantir on a VAX?

QuickCode on a PDP-11?

DISC-DBL on a VAX?

PerfectWriter on a PDP-11?

WordStar on a PDP-11?

Spellbinder on an Eclipse?

Friday! on a VAX?

PerfectWriter on a PRO?

RM/COBOL on a PDP-11?

RTCS/UDI on a VAX?

Mass-11 on a PDP-11?

Milestone on an Eclipse?

Lotus 1-2-3 on a Micro VAX?

Peachtree on a VAX?

SpellStar on a Micro VAX?

Mass-11 on a PRO?

Datebook II on a VAX?

PMS II on a PDP-11?

Final Word on an MV/10000?

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Shriver wins TCA award

VIENNA, Va. — The manager of telephone services west for Boeing Computer Services has won the Telecommunications Association's (TCA) E.E. Pesavento Award.

George Shriver earned the award, according to TCA President Randine Wilcox, for his work in advancing the group's objectives. The award is given to a TCA member making the most significant contribution to the advancement of the association, according to TCA.

Shriver has worked in the communications industry for 21 years and manages Boeing's Puget Sound area local telephone service in Washington state.

NEWS

DEC introduces low-end member of PDP-11 family

By Eric Bender
CW Staff

MERRIMACK, N.H. — Digital Equipment Corp. has introduced the MicroPDP-11/SV, a low-end member of the DEC PDP-11 family that supports up to four users.

The new micro's base configuration includes the F-11 CPU, 512K bytes of main memory, a 10M-byte hard disk drive, a 400K-byte floppy disk drive and a four-slot backplane.

The MicroPDP-11/SV is fully compatible with other members of the PDP-11 line, offering an upgrade path extending up to 4M bytes of main memory and 208M bytes of hard disk storage, the company said.

More than 2,000 application packages are currently available for the more than 300,000 systems that make up the PDP-11 family's user base," and most of these packages will run on the new machine, DEC said.

Central role for DEC A-to-Z

Emphasizing a central role for the DEC A-to-Z Integrated System software on the new micro, DEC executives pointed to a growing number of programs written by third-party firms for the A-to-Z environment. DEC will offer the Micro/RSX operating system and the base A-to-Z system software together

for \$1,000, according to Don Byrne, manager of the A-to-Z marketing group.

Industry analysts generally commented favorably on the introduction. Most important, the new micro represents a logical way to leverage the PDP-11 customer base, commented Michael Geran, vice-president for research at E. F. Hutton & Co.

in New York. "Second, there are a lot of add-ons and life extenders," Geran noted. "Third, they know how to build these things."

"DEC continues to try to evolve a strategy at the low end, and the strategy is three steps forward and two steps back," Geran added. "This is a step forward."

Company officials under-

lined DEC's commitment to the PDP-11 line. "In the foreseeable future, the need for low-cost systems will continue to create a need for 16-bit processors," Byrne said.

The system carries a starting price of \$5,995, 39% below the previous entry price for the PDP-11 line. A system with a 31M-byte hard disk drive will cost \$1,500 more

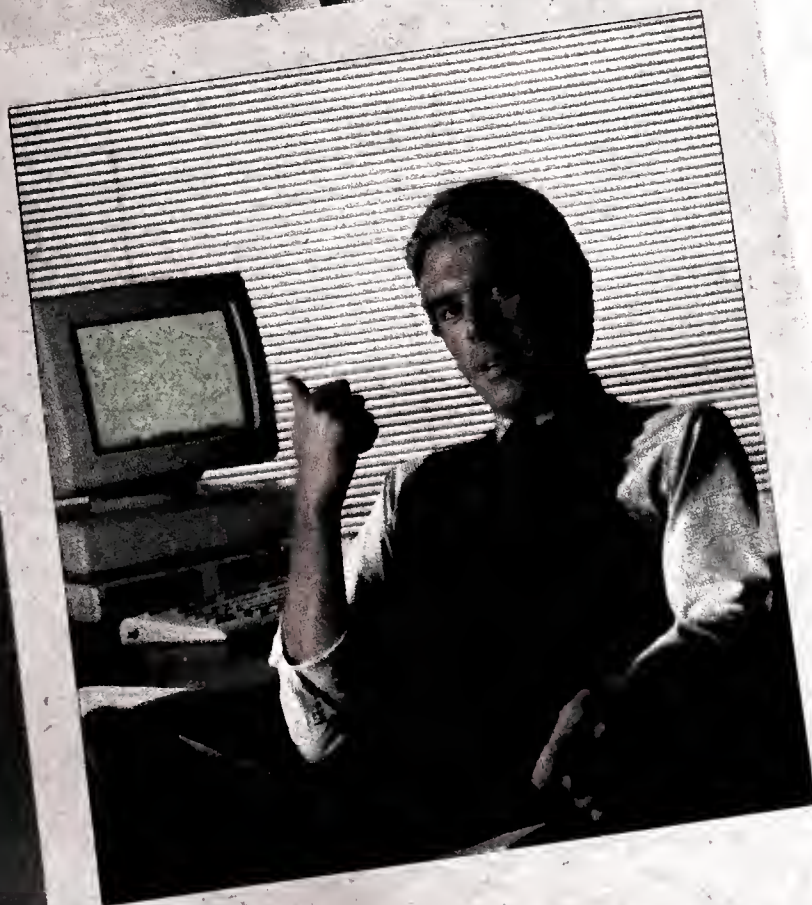
than the base price. A four-user setup with dot-matrix printer will be priced at about \$3,200 per user, officials estimated.

Aimed primarily at small business and OEM sales, the MicroPDP-11/SV is shipping now, DEC officials said.

DEC's Business Computer Group is located in Merrimack, N.H. 03054.

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ABA meet scheduled for Feb. 3-6

WASHINGTON, D.C. — The impact of changing telecommunications technologies on banks will be the focus of the American Bankers Association (ABA) 1985 Telecommunications and Financial Networks Conference at the Hyatt Regency Hotel in New Orleans Feb. 3-6.

Speakers will include Charles Brown, chairman of the board of AT&T; William McGowan, chairman at MCI Communications, Inc.; and Henry D. Levine, partner in the law firm of Morrison and Foerster. They will address the state of banking telecommunications technology, plans for the future and business opportunities in the competitive environment.

Three general sessions, 30 concurrent sessions and a product exhibition are scheduled. Registration fees are \$480 for ABA members and \$600 for nonmembers.

Registration information is available from the ABA at 1120 Connecticut Ave. N.W., Washington, D.C. 20036.

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April 9, 1984

Mr. Margaret Wells
Apartment D
4500 Dana Drive
San Jose, CA 95128

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Employee Number: 242-23-3943
Social Security Number: 015-7634
Date of Birth: 01/15/49
Sex: F
Marital Status: S
Number of Dependents: 0

In Case of Emergency:
Mr. or Mrs. R. W. Wells
205 East in the Pines
Wilmington, NC 28402
919/555-1234

Relationship: Parents

Insurance Information:
Type: Carrier
Life: Mutual
Medical: Blue Cross Blue Shield
Please verify this information and return to me by May 1, 1984. If any of the information is incorrect, please note the changes on this form.

Thank you for helping us keep our files current.

Sincerely,
Tony Tillam
Human Resources

Steven Manufacturing Co.
11 Lawrence Court
San Jose, CA 95128
(408) 555-1234
217 Delaware

Command ==> _ Edit SAS data set: EMP.INFO

Employee Information

Employee Number: 109649
Employee Name: Ms. Margaret Wells
Department: Marketing Location: Bldg A Work Phone: 4938
Birthdate: 04/25/57 Sex: F Marital Status: S
Number of Dependents: 0 Social Security Number: 242-23-3943

Home address: Apartment D
4500 Dana Drive
San Jose CA 95128
Home phone: 555-7634

Information about Employee's Spouse:
Spouse's Name: N/A
Spouse's Employer: N/A Work Phone: N/A

In case of an emergency, please call:
Mr. or Mrs. R. W. Wells
205 East in the Pines
Wilmington, NC 28402
919/555-1234

Insurance Information: Carrier dependents covered
Massachusetts Mutual No
Blue Cross Blue Shield No

The accounting staff can quickly produce budgets and spreadsheet reports.

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San Jose, CA 95128
(408) 555-1234

	1983	1984	1985	1986
Revenue	1,200,000	1,300,000	1,400,000	1,500,000
Expenses	(800,000)	(850,000)	(900,000)	(950,000)
Profit	400,000	450,000	500,000	550,000
Operating Costs	1,000,000	1,050,000	1,100,000	1,150,000
Fixed Costs	600,000	620,000	640,000	660,000
Variable Costs	400,000	430,000	460,000	490,000
Operating Income	200,000	250,000	300,000	350,000
Interest Expense	(50,000)	(55,000)	(60,000)	(65,000)
Income Before Taxes	150,000	195,000	240,000	285,000
Income Taxes	(45,000)	(58,500)	(72,000)	(85,500)
Net Income	105,000	136,500	168,000	199,500

Summary (in thousands)

	1983	1984	1985	1986
Revenue	1,200	1,300	1,400	1,500
Expenses	(800)	(850)	(900)	(950)
Profit	400	450	500	550

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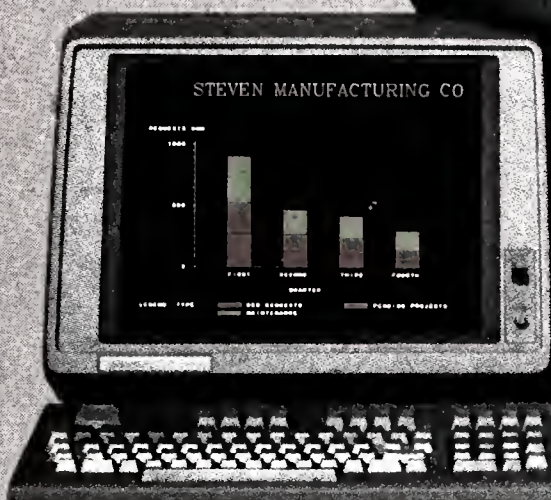
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FOR APRIL 9, 1984

DEPARTMENT	JOBNAME	CPU MINUTE			I/O COUNT	
		NUMBER OF EXECUTIONS	SUM	MEAN	SUM	MEAN
ACCOUNTING	JACCT110	3	55.32	18.44	11372	3791
	JACCT120	7	38.97	5.57	34968	4995
	JACCT220	8	103.95	12.99	74237	9280
	OTHERS	25	113.76	4.55	56085	2243
HUMAN RESOURCES	OTHERS	18	31.00	1.72	50314	2795
LEGAL	OTHERS	16	17.00	1.06	8218	514
MARKETING	JMKTG170	3	31.35	10.45	13957	4519
	JMKTG200	9	145.36	16.15	159131	17681
	JMKTG15	8	82.33	10.29	43748	5469
	JMKTG30	7	67.01	9.57	132357	16908
	OTHERS	21	89.99	4.28	100880	4804
PLANNING	OTHERS	17	43.00	2.53	27479	1616
PRODUCTION	JPROD200	12	80.47	6.71	107271	8939
	JPROD500	7	170.00	24.29	69020	12717
	JPROD650	4	56.35	14.59	91561	22890
	OTHERS	24	142.18	5.92	108352	4515
SYSTEMS	JSYS225	4	38.47	9.62	22519	5630
	JSYS670	4	24.82	6.15	39212	9003
	JSYS700	4	47.38	11.84	41780	10445
	JSYS850	4	49.87	12.42	40258	10064
	OTHERS	17	33.88	1.99	114291	6723
ALL JOBS		222	1440.00	6.49	1366608	6156

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NEWS

Exxon Office Systems lays off 300, seeks buyer

By David Olmos
CW Staff

NEW YORK — Exxon Corp. early this month laid off 300 U.S. employees at its Exxon Office Systems Co. subsidiary and announced plans to spin off the unit's Pennsylvania manufacturing operations into a separate company.

The unprofitable office systems division, which has been up for sale since at least November 1984, has been struggling to compete against other office automation equipment vendors, including IBM, Wang Laboratories, Inc. and Japan's Canon, Inc. and Sony Corp. One hundred and fifty people will be laid off at the division's Lionville, Pa., manufactur-

ing plant, evidently in response to a worsening sales picture as Exxon seeks a buyer.

The new Lionville Manufacturing Corp. has been spun off as a separate business under Exxon Enterprises, the oil giant's unit responsible for diversification efforts, according to Ann Frechette, an Exxon spokeswoman. The Lionville facility has manufactured products for the office systems group but has now suspended production pending the sale of the unit. The plant will continue to manufacture electronics products for other Exxon divisions and do contract work for third-party customers. "We hope to now be able to provide expanded manufacturing capability to

third parties," Frechette said.

V.N. Tirendi, formerly vice-president of manufacturing at the Lionville facility, has been named to head the newly formed company. It is not yet known what Tirendi's formal job title will be, Exxon said.

Exxon also announced plans to lay off approximately 150 people this month at its Forrestal Center, a Princeton, N.J., R&D facility for the office systems group. Only a handful of employees will remain at the facility to "pursue some ongoing projects," Exxon said.

The layoffs at the Exxon Office Systems division, based in Stamford, Conn., amounted to 15% of the total worldwide workforce, which now

numbers 2,000.

Meanwhile, Exxon said negotiations with potential buyers of the unit are continuing.

The division markets several products, including Qyx, an office electronic typewriter, and Qwip, a digital facsimile unit. Other products include the Exxon 500 word processor and the 965 ink-jet printer. Some of the unit's products were supplied by other manufacturers.

Some facilities not for sale

With its latest move, the company has effectively removed its manufacturing and research facilities from inclusion in any sale of the organization.

Amy D. Wohl, an OA consultant in Bala-Cynwyd, Pa., said the layoffs and Lionville plant spin-off may be signs that the company is preparing to close the division. She said she is doubtful that Exxon will be able to find a buyer.

"The only things Exxon really has to sell are its installed base [of products], which is small, and its distribution network and staff," Wohl said. The most likely buyer would be a European or Japanese company looking to acquire a U.S. distribution capability, she said.

In a related matter, a group of 27 office equipment dealers have filed a \$100 million suit in federal court against Exxon and Exxon Enterprises, claiming that Exxon made misleading statements concerning its intentions to remain in the office systems business.

Information center class set

NEW YORK — The American Management Association (AMA) is sponsoring a three-day course titled, "Implementing and Managing Information Centers," from Feb. 6-8 at AMA headquarters here and at the Miyako Hotel in San Francisco from March 4-6.

The course leader will be Marilyn J. Richardson. Richardson is a consultant, seminar leader and writer on end-user education at McMahon & Richardson of Denver. The company helps companies establish information centers and technical training curricula.

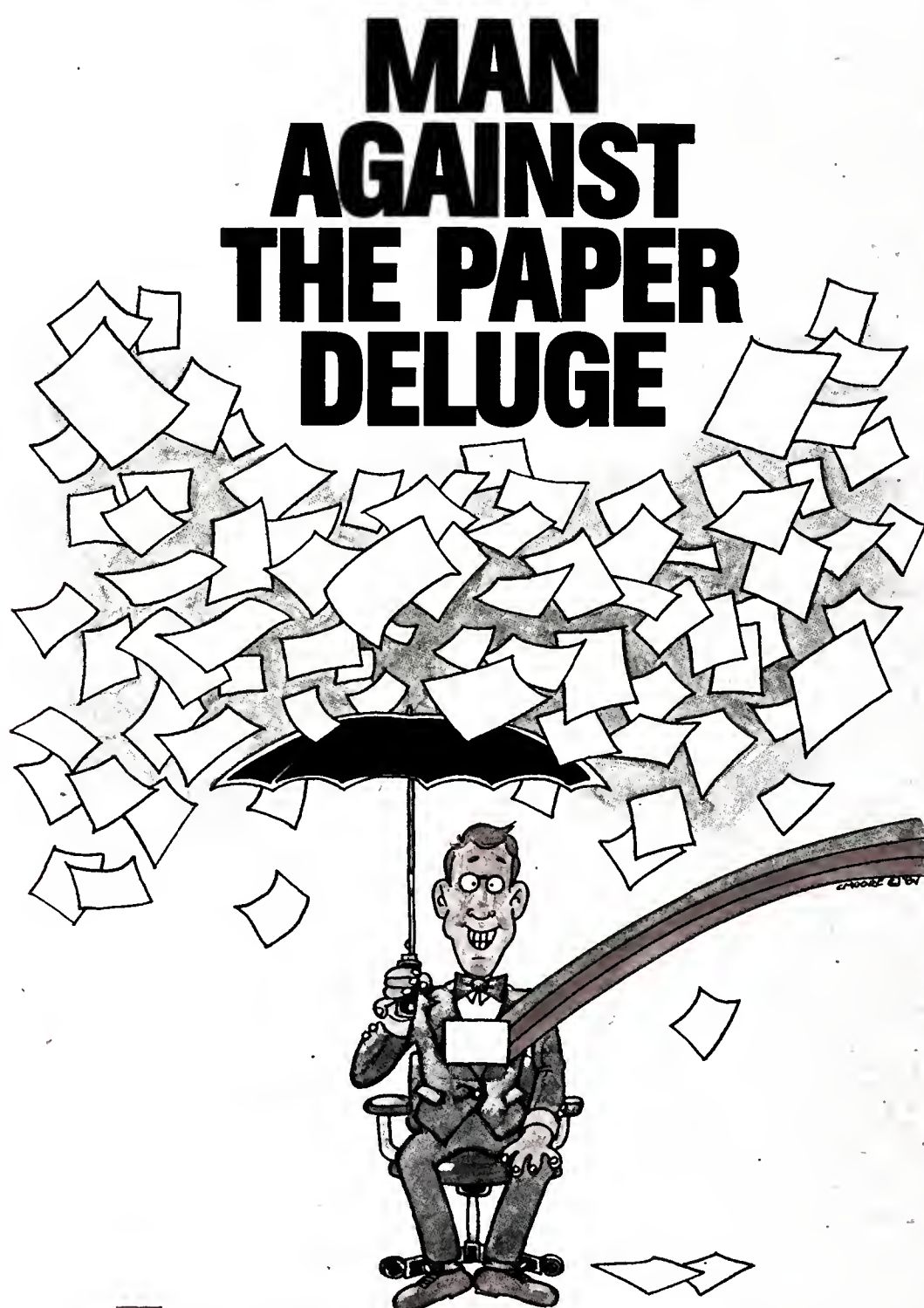
The AMA course is aimed at information center managers and staff, MIS managers, user liaison staff, personnel managers and data trainers.

Information center concepts covered

The course covers basic information center concepts, a framework for information centers, information center product selection, staff, resource management, guidelines and procedures, education strategies, information center marketing and expansion planning.

Registration for the three-day course costs \$750 for AMA members and \$860 for nonmembers; group rates are also offered.

More information is available from Beth Ranney, Program Director, AMA, 135 W. 50th St., New York, N.Y. 10020.



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NEWS

SEC security system foils break-in

WASHINGTON, D.C. — The Securities and Exchange Commission's (SEC) new computer security system last month successfully foiled an attempted break-in by an unauthorized user, an agency spokeswoman said.

A computer hacker tried to gain unlawful access to data stored in the agency's new computer — the Electronic Data Gathering Analyzing and Retrieval System (Edgar) — through a telephone connection but was repelled by the security system, said Mary McCue, the SEC's public affairs director.

The hacker was unable to read the system's files, but instead saw displayed a warning that the attempt had violated federal law, McCue said. No effort was made to try to identify the unauthorized user.

McCue declined to comment on whether there have been any other attempted break-ins of Edgar since the first incident. She also declined to provide additional details on the security system.

The Edgar system, which began operating on a test basis last September, is built around an IBM 4341 mainframe.

The security features of the system were designed in consultation with the Federal Bureau of Investigation.

Edgar was designed to computerize the SEC's corporate information files for more efficient storage and dissemination to investors and others. McCue said the agency collects six million pages of information a year.

IBM subject of conference

BOSTON — A two-day seminar sponsored by the Yankee Group will discuss how IBM has changed in the last two years.

The seminar will be held Feb. 5-6 at the Plaza Hotel in New York and Feb. 12-13 at the Claremont Resort in Berkeley, Calif.

The conference is called "The Sovereign State of IBM," and will cover such topics as IBM large system processors, storage and operating systems, how users should integrate IBM's new products into corporate information strategies and IBM data base management and application development directions.

The ways in which personal computers have begun to make distributed processing a reality will also be discussed.

The registration fee for the first person in an organization that attends the conference is \$875, while other people can attend the conference by paying \$775, according to the sponsor.

More information is available from the Yankee Group, located at 14th Floor, 89 Broad St., Boston, Mass. 02110.

Micom, Interlan merge joins technologies

WESTFORD, Mass. — Interlan, Inc., a privately owned manufacturer of cable-based local-area network products here, will be acquired for about \$49 million by Micom Systems, Inc., a Simi Valley, Calif.-based manufacturer of a data private automated business exchange (PABX) and other communications products.

Interlan will operate as a wholly owned subsidiary of Micom under the merger, which Micom President William A. Norred said will eventually "offer a local network approach that integrates data PABX and cable-based [local-area network] technology in a single, local network system."

Paul Severino, president of three-year-old Interlan, said the merging of the firms presents an opportunity of "building a leading-edge communications company."

Severino, who will remain as head of Interlan, said the merger moves his company from \$18 million in revenues last year to a position with Micom as "the leading [networking] company overnight and provides some significant capabilities for future growth."

nificant capabilities for future growth."

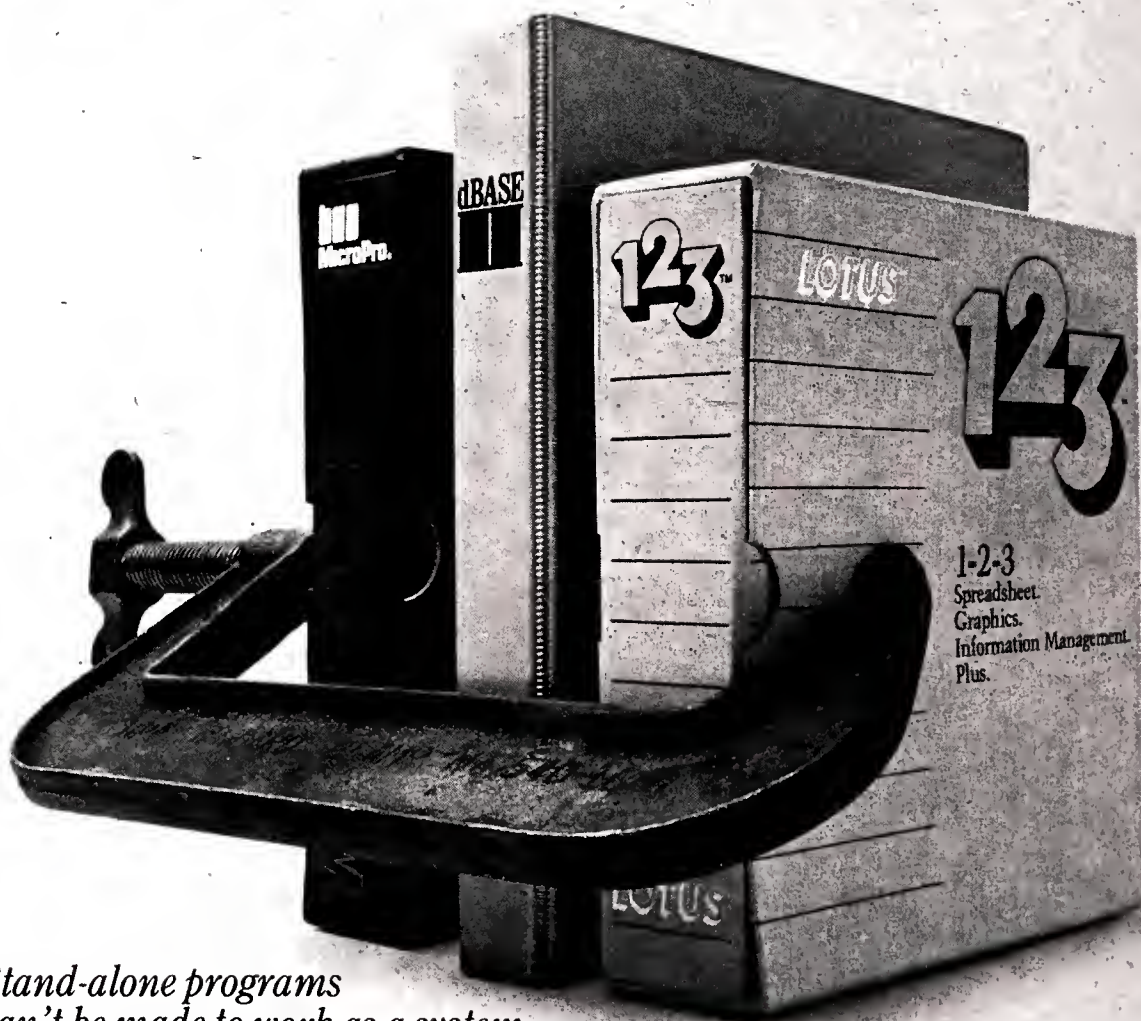
Under the terms of the agreement, the acquisition is expected to be completed by March 1, with Interlan shareholders receiving 1.75 million shares of Micom stock as long as the average price of that stock prior to the merger remains above \$27 per share.

The sales organizations of the two companies will be combined to add a direct sales and support layer to Micom's existing manufacturer's representative and distributor channels, a Micom spokesman said.

Micom said it posted sales of \$170 million during the past 12 months, with its Micro600 PABX accounting for \$50 million of that total.

Norred said PABXs have handled the "lion's share" of local-area network connections by linking data terminals to host computers. "But with the rapidly expanding use of personal computers . . . customers are looking for local networks [that] are both inexpensive for interactive terminals and capable of high-speed file transfer," he said.

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NEWS

System's terrain models aid in landscape preservation

By Donna Raimondi
CW Staff

LAKEWOOD, Colo. — When Colorado's newest winter sports complex was designed, the U.S. Forest Service here used its computer system to ensure that the design's visual impact on the landscape would be as minimal as possible.

The U.S. Forest Service is responsible for the visual integrity of all national forest lands, said Hubertus Mittman, regional landscape architect with the Rocky Mountain region of the service.

People use forest regions mainly in the winter and primarily for downhill skiing, Mittman said. The upper slopes of most areas are on Forest

Service land, he added.

Ski area developers have traditionally scarred the land by cutting straight through the forests, leaving wide trails that were ugly to look at in the summertime, Mittman said, but that is all changing.

Model permits views from all angles

A three-dimensional model of any planned changes to the landscape now allows the Forest Service to view such development from all angles and from different locations in order to minimize the visual impact on the area, he said.

The plans for Beaver Creek Complex — developed by the Vail Association and situated seven miles from

the Vail, Colo., ski area — were checked out through the Forest Service system from beginning to end, Mittman said.

The planners wanted to know how they could study the design impact from several locations, so they joined with the Forest Service; Devon Nickerson, independent designer of the Perspective Plot software used; and Hewlett-Packard Co., whose system the software runs on, to ensure a correct design, he said.

The computer system is composed of an HP 9020 32-bit desktop workstation with 1M byte of storage, a 16M-byte Winchester disk drive, an HP 2932A graphics printer, an HP 7580A drafting plotter, a California

Computer Products, Inc. 9000 digitizer and the Perspective Plot package, Mittman said.

Used primarily for timber harvesting

The system is one of more than 80 similar configurations owned by the Forest Service, said Nickerson, formerly of the Forest Service and now a consultant. Most of the systems are located in the Pacific Northwest and are used primarily for timber harvesting purposes on steep terrain, he added.

The Forest Service buys topographical data that the U.S. Geological Service gathers from satellites, Mittman said. That information is stored on a Sperry Corp. 1100 series mainframe at the Department of Agriculture in Fort Collins, Colo., and extracted as needed, he said. The data — along with information gathered by Forest Service personnel — is digitized into the HP system to obtain a three-dimensional model of the topography, he explained.

Different kinds of trees in different densities can be added to or deleted from the map, Mittman said. Roads, soil manipulation (removal of rocks or dirt) or parking lot plans can be added, changed or moved, and then the area can be viewed from a variety of angles: aerially, from a certain road or from any chosen elevation, he said.

Because Forest Service computer use is decentralized, the software was designed so that field people can come in to the center, learn the system in a few hours and use the equipment on their own, Mittman said.

Plots not as good looking as photos

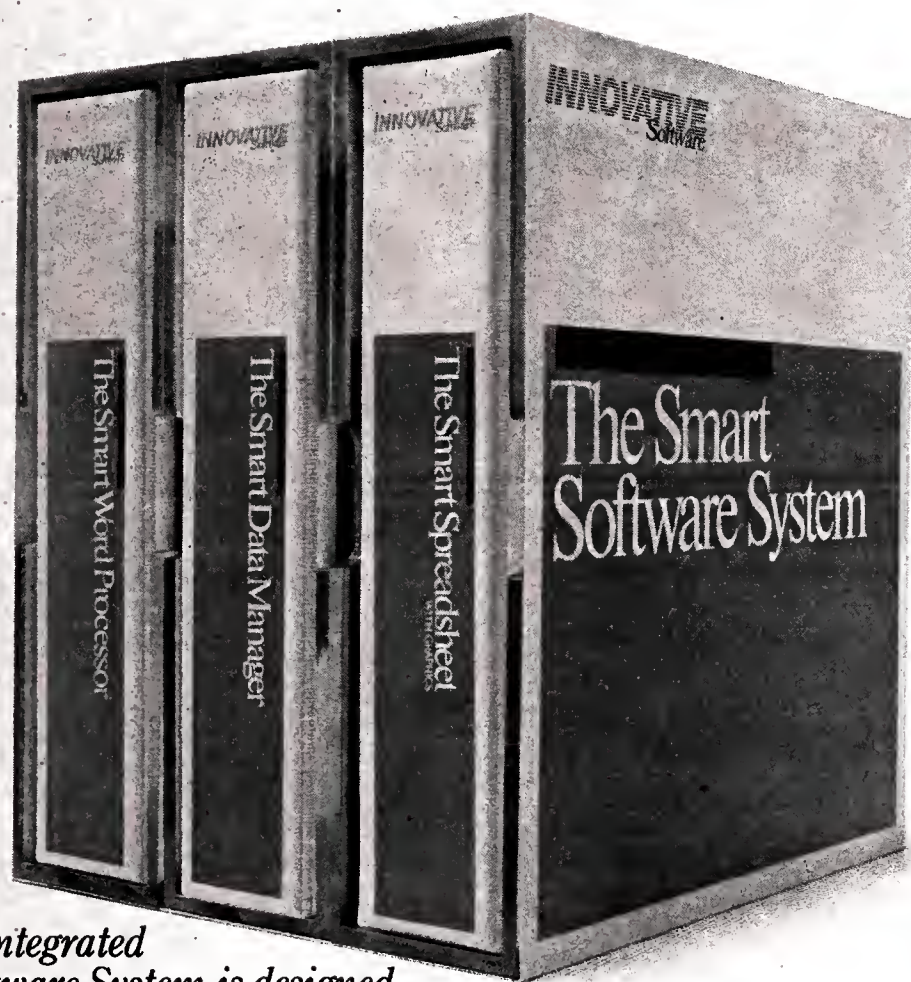
"I did plots of alternative clearing proposals and structures [towers and the ski lodge] for the Beaver Creek project," Nickerson said. "We mixed and matched and had a very accurate preview of the design," he said. The plots are not as good looking as photos or artist renderings, he said, but are impartial and geographically accurate.

The Beaver Creek trails were checked out and changed as needed using the system, Mittman said. Any new trails or trail improvements there or at any ski area involving Forest Service land will have to be run through the system for approval, he added.

Mittman said he hopes to use the plotting system for more than ski area design.

The software is being redesigned to satisfy other needs, such as determining the effects of timber cutting, tree growth and surface mining on the topography, he added.

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NEWS



**INTERNATIONAL
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AUSTRALIA

MELBOURNE — Australian software experts are being courted with lucrative job offers by Ricoh Co., a major Japanese maker of peripherals, cameras and office equipment. Ricoh recently approached the software industry committee of the Australian Computer Society seeking senior researchers who would be available to relocate to a new software development center Ricoh is establishing in Tokyo. Karl Reed, national chairman of the committee,

said Ricoh asked for experienced researchers in data base management systems, computer-aided design, pattern recognition and artificial intelligence. Ricoh is said to be interested in one- or two-year signed contracts and claims it has state-of-the-art laboratories. Inquiries are being accepted by Reed at the Royal Melbourne Institute of Technology, 124 Latrobe St., Melbourne 3000, Australia.

CHINA

BEIJING — Wang Laboratories, Inc. has announced that it is establishing three joint ventures to be located here and in Shanghai and Xiamen. The joint ventures will assemble, sell and lease Wang's VS superminis, workstations, network products and micros.

FRANCE

PARIS — Bull has signed two major OEM contracts for the distribution of its Micral 30 microcomputer, which was unveiled in December. The first contract was penned with Jistral, a subsidiary of the Jeumont-Schneider group, which will offer the micro as a workstation in a network setting. The second was signed with Honeywell Information Systems Italia, which will distribute the Micral 30 in Italy under the Honeywell label.

JAPAN

TOKYO — The Sanno Institute of Business Administration here has recently reported its 12th annual survey of 3,896 computer installations in Japan. Fujitsu Ltd. claimed a 30.7% share of these systems, followed by Hitachi Ltd. with a 17.4% market share, narrowly leading IBM with a 17% share of Japanese DP shops and NEC Corp. with 15.8%. Compared with last year's figures, IBM slipped to third and changed places with Hitachi.

WEST GERMANY

WILDBAD KREUTH — During a closed-door meeting of the Christian Social Union party here, guest speaker Heinz Nixdorf, chairman of the board of Nixdorf Computer AG, warned of the precarious position the German computer industry is currently in because of the monopolistic behavior of unnamed market-dominating vendors that determine world standards. He said Japan's intent to dominate the world marketplace presents an added threat to the German electronics economy. Finally, he noted that the disruption of the market economy via state and government intervention, such as practices by the U.S. Department of Defense, is also detrimental to Germany's computer industry. It is thought in Europe that the DOD's high-tech import/export policies favor the U.S. while working against European vendors.

HEUSENSTAMM — Beaugrand Datentechnik GmbH has been purchased by the British manufacturer ACT, according to former company Director Lutz-Dieter Beaugrand. ACT plans to take over the Beaugrand stake in the Alphatext distribution organization and also introduce the ACT product line in Germany.

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Specifically, the VAX 8600 system incorporates four-stage pipelined processing that increases throughput by allowing the system to execute one instruction while it simultaneously decodes a second, generates an address for a third and

fetches a fourth. There's also a floating point accelerator that speeds floating point operations.

Even with all its power, the VAX 8600 system conserves floor space. The CPU fits into the same size cabinet as the VAX-11/780 CPU. Power consumption and air conditioning requirements are similar, too.

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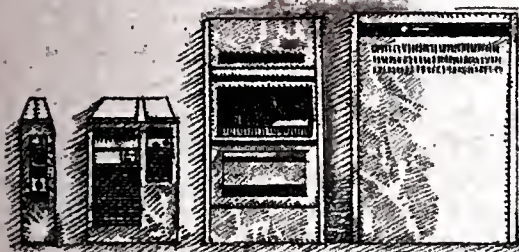
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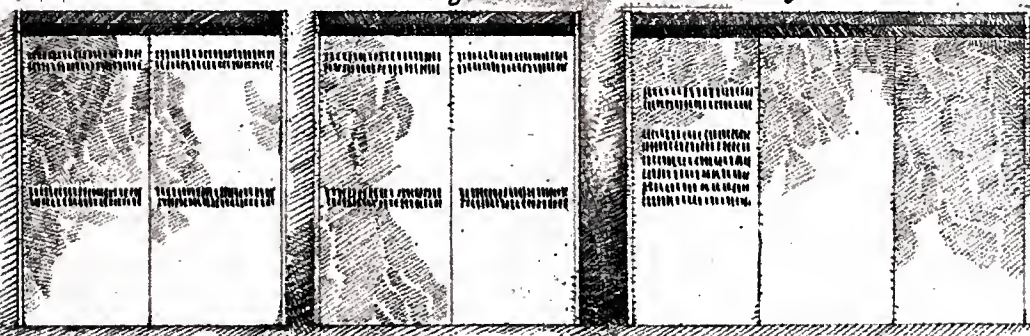
VAXcluster systems can be configured with up to 16 processors and storage servers in a variety of combinations. You can boost computing power in an existing VAXcluster configuration by adding a VAX 8600 system. Or you can build a new VAXclus-

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Telecom system tightens ad agency's client network

TORONTO — Ask people to name a high-pressure, stressful communications-intensive environment and advertising is often among the first few mentioned. The industry is very competitive and fast-paced, and the stakes are always high. Using a fusion of market research, psychology and art, advertising aims at increasing client revenue through persuasive and effective communication.

An advertising agency's telecommunications system is the cornerstone of its daily operations, and the system at Saffer, Cravit & Freedman (SCF) here is no exception. As Canada's largest retail ad agency, in business since 1968, the company boasts a client roster that includes Towers Department Stores, Firestone Tire & Rubber, Peoples Jewelers, Bata Shoes, Home Hardware and Toronto's Eaton Centre. But success did not come without problems. "The agency's growth rate had a serious effect on its telecommunications services," recalled Connie Browne, office administrator at SCF. "This agency began with a staff of eight, and now we have [more than] 160 employees in our Toronto headquarters."

Browne saw the agency outgrow four upgrades in the equipment provided by Bell Canada Telephone Co. in fewer than five years. "We were using [a Bell Canada] SG-1 system and, despite assurances from [Bell Canada], our rate of growth was not taken into consideration. Replacing equipment on an almost yearly basis is very expensive," she continued.

In 1981, SCF selected the Focus digital private branch exchange from American Telecom, Inc. of Anaheim, Calif. The Focus system's reliability and its capacity to expand were the deciding factors for the agency, Browne noted.

Service for the system is provided by interconnect Canadian Telecommunications Groups (CTG) based here.

"In advertising," Browne said, "proper call handling is extremely important. This is a service business, and success means, very simply, providing clients with the best possible service. A reliable communications system was mandatory."

"This business is based on trust. In order for a client to see us as an extension of his own organization, he must be made to feel confident [with] our internal operations [and with] how quickly a message is delivered," she said.

SCF's two-cabinet system, which houses some 161 lines and 24 trunks, routes all incoming calls through two Focus main attendant consoles.

"The system operates very well. We haven't experienced any problems. With Focus, calls are now answered before the fifth ring, which is how business calls should be handled," Browne maintained. "And our clients noticed the difference."

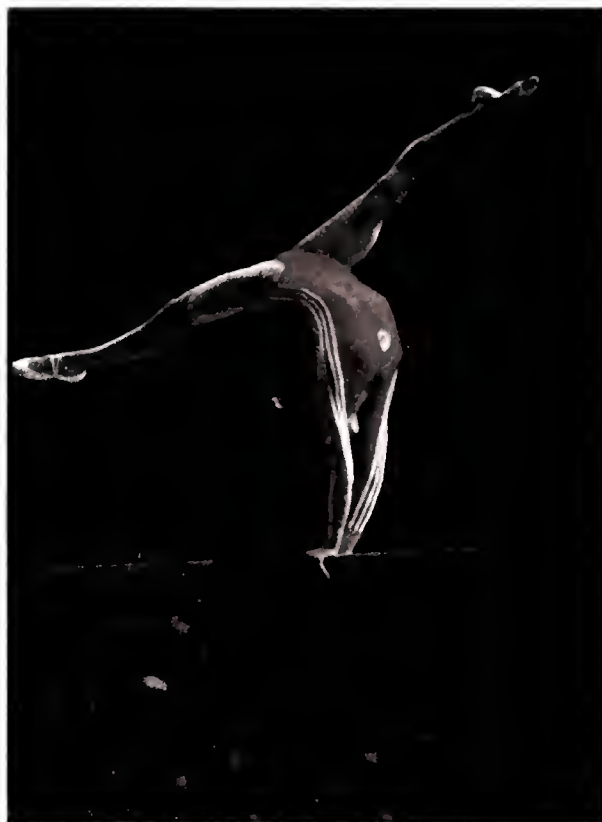
Physical growth

In keeping with its past growth performance, SCF is in the middle of planning a move to a new Toronto location and will grow in office space from 28,000 to 37,000 square feet.

Browne said Focus will make the transition to new offices easier. "The good thing about Focus is that it won't interfere with [our expansion] process," she recounted. "Before, our growth was always a problem. And after the move we'll be looking at some of the more important cost-management features the [Focus] system offers, like station message detail recording and automatic route selection."

Service representatives from CTG have used the Focus system's remote system maintenance feature to make administration changes or software changes to the system from the interconnect's own Toronto office.

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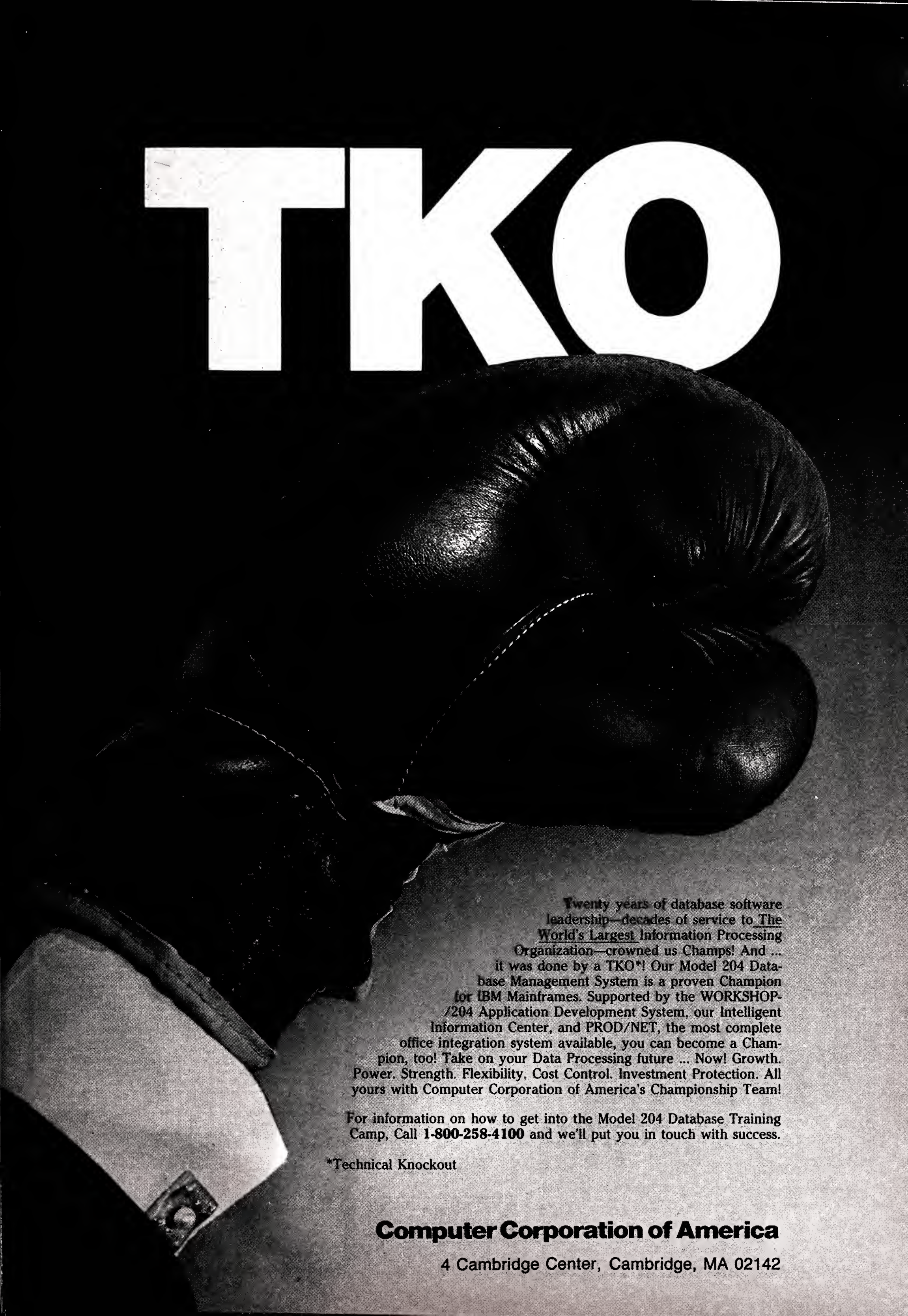


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NEWS


OFF THE PRESS
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BOOK REVIEWS
OFFICE SYSTEMS

 By Samuel Kalow
 and Ercole Rosa

If, as the authors premise, many businesses convert to the office of the future in the next five to 10 years, then a manager's guide such as this one makes sensible reading. Whatever offices come to look like and however they come to operate, integration of systems figures to be the key. Integration is what this book is about.

Change requires a change agent: "Someone has to say that increasing the lead time with a better office system is possible and important, and it should be done." The change agent can argue for an office system that cuts business overhead or one that increases business productivity. Apparently, the authors from IBM believe these goals are mutually exclusive or at least not compatible.

The key justification for new office systems is the elimination of redundancy. The authors write, "The opportunity of electronic document distribution, because of the declining costs of broadband communications, will become the major reason why people will change office equipment, office sys-

tems and office procedures."

Nonimpact printing (laser and ink-jet) will precipitate change, as will bubble memory, which would enable voice recognition and synthesis through the storage of one billion bits of information in a cigarette-pack size device.

But what is needed is a plan, a proposal of how an organization should get to that wonderful-sounding office of the future. The office systems plan launched in Chapter 4 recognizes the need to relate office goals to overall organization objectives.

A systems manager, drawn from word processing, data processing, telecommunications or even general management, must understand which way the information flows, in what amounts and for what reasons. Ideally, this manager chooses a team of individuals from various departments affected by a new system, thus encouraging backing for it after installation. As the authors so aptly note, "People support what they help create."

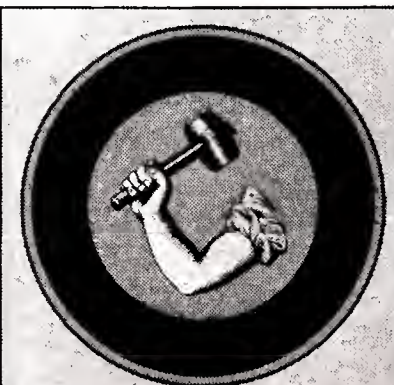
The book presents more on managing system development and a bit on evaluating alternatives. Ramifications of technology are highlighted. For instance, electronic document distribution (a favorite with the authors) will so speed up mail delivery that a sender (the boss, for example) can expect an answer immediately. No more hiding behind the float-time of the current physical mail system.

Curiously, this work from a major publisher includes instances of sloppy editing as well as typographical errors not normally found, for good reason, in books. These errors make a reader wonder what else escaped the editor's eye.

Paperback, 212 pages, \$10.95, ISBN 0-13-633149-1. Prentice-Hall, Inc., Englewood Cliffs, N.J. 07632.

**WORK TRANSFORMED:
 AUTOMATION AND
 LABOR IN THE
 COMPUTER AGE**
 By Harley Shaiken

Now computers are dis-



**AUTOMATION & LABOR
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HARLEY SHAIKEN

rupting the life of the working man.

Author Harley Shaiken formerly worked as a skilled machinist and is now a student of the social impact of automation working as a research associate in MIT's Program in Science, Technology and Society.

Using case studies, he captures the forces molding automation of the shop floor, including the die makers' turf and the use of computers to break strikes.

The author requires that the reader accept two premises. First, the potential of computers to enrich life fundamentally contradicts management's goal to achieve

more power and control by using computers. Second, detailed descriptions of tool and die shop politics illustrate that contradiction.

Shaiken is convincing that the "us vs. them" paranoia inherent in the labor-management struggle really does relate to automation, which is management's ultimate solution for reducing labor costs and increasing control over manufacturing. In a typical paradox, experienced workers are needed to help debug numerical control programs. But early efforts to automate die-making at General Motors Corp. failed because skilled workers be-

See REVIEW page 34

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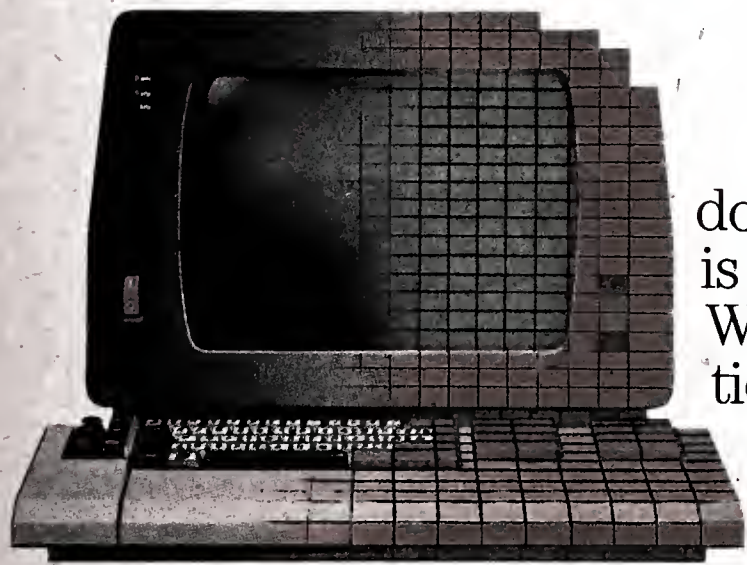
Customized course offerings are also available for on-site sessions at company installations.

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NEWS

REVIEW from page 32

lieved programs they helped perfect would be used to replace them.

Automated systems have eroded the effectiveness of workers' ultimate weapon against their employers — the strike. The now-defunct Patco airline operators union is a case in point. Instead of the Patco strike paralyzing air travel, the government used preplanned computer programs to maintain the air traffic control system with fewer people. Thus, dismissing union members succeeded.

Shaiken does not clarify where labor and automation go from here. He borrows his "Technology Bill of Rights" from an International Association of Machinists 1981 conference and leaves us wanting more about contemporary solutions in response to disruption of the workplace by automation. It is hard to accept his notion that "a more authoritarian workplace would have a corrosive effect on democratic values throughout society," especially since fewer American workers sign up as union members each year.

Hardcover, 306 pages, \$17.95, ISBN 0-03-042861-2. Holt, Rinehart and Winston, 383 Madison Ave., New York, N.Y. 10017.

— John Desmond

MANAGING INFORMATION: THE CHALLENGE AND THE OPPORTUNITY

By John Diebold

A reader expects fresh thoughts from one so famous as John Diebold, founder of the international management consulting firm and author so many years ago of a landmark work, *Automation*.

This book compiles speeches dated 1979 and 1980 and suffers as do all such collections. The reader keeps wanting to corner the writer and say, "OK, but what do you believe now?"

Some observations were shrewd enough, or general enough, to appear to apply as well today as five or six years ago.

Too often, routine work is automated and that is all — "manage-

ment without vision," according to Diebold. The real benefits to any office result from linking the various elements of an executive's job "to eliminate the tedious and often error-prone intermediate stages in the collection, processing, transfer and/or storage of information."

The question for the future (and perhaps for the present), Diebold proposed in a 1980 speech, is: Can companies afford not to have computers for all the people who could use them? If that question applied five years ago, how much more valid is it today?

"Today," Diebold wrote, "information technology is the domain of a small 'elite.'" That statement, like others, rang true once but no longer. "The mind boggles when one thinks of prospects for commercial Josephson systems," he said elsewhere, ex-

pressing enthusiasm more appropriate to 1980 than now.

The advice in Chapter 2 continues to be well taken. Diebold told senior management: Develop new guidelines for investing in MIS; adjust to the proliferation of micros; take into account the increased importance of telecommunications; define the new role of information professionals; and decide how office automation can change not only the way work is performed, but what that work is and where it is done.

If this advice was not followed in 1979, why give it again in 1985?

Hardcover, 131 pages, \$14.95, ISBN 0-8144-5793-2. Amacom, 135 W. 50th St., New York, N.Y. 10020.

BOOKS OF NOTE

INC. MAGAZINE'S DATABASE

SICS, a guide to on-line business information, by Doran Howitt and Marvin Weinberger. Paperback, 614 pages, \$16.95, ISBN 0-8240-7287-1. Garland Publishing, Inc., 136 Madison Ave., New York, N.Y. 10016.

THE OFFICE AUTOMATION REFERENCE & BUYER'S GUIDE, an expanded third edition listing 2,500 manufacturers and suppliers. Paperback, \$49.95. Published for the Association of Information Systems Professionals by Butterfield Press, Inc., Brookfield Office Park, 304 Federal Road, Brookfield, Conn. 06804.

THE BROWN BOOK, an industry guide for microcomputer pricing. Paperback, 266 pages, \$375 for six quarterly updates. The Brown Book, Inc., P.O. Box 3490, Santa Barbara, Calif., 93130.

18 Reasons We're Uniquely



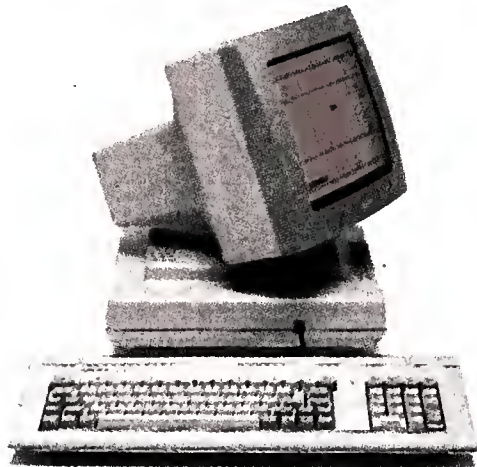
1 There's our position on the bottom line. Simply put: No one can match our emulations, editing and ergonomics for \$549. Can anyone better this price?



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NEWS

Tool speeds insurance firm's application development

ALBUQUERQUE, N.M. — Mountain States Life Insurance Co., an insurance company headquartered here, is using fourth-generation productivity tools to speed up application development in support of more than 30,000 policy holders.

Mountain States Life had been using IBM's DMS for application development, but the data processing staff of 10, working with an IBM 4331 Model I, was frustrated by the delays and the limited calculation power of DMS, said Allan Smith, Mountain States' data processing manager. At one time, the company had to support a mortgage processing work load in addition to the life insurance requirement, he said. Both program-

mers and management were thwarted by a slow development process and a growing applications backlog, he added.

Under Smith's direction, the staff evaluated a few commercially available fourth-generation productivity products and narrowed down the choices to keeping DMS, changing to command-level Cobol or getting Oxford Software Corp.'s User Files On-line (UFO), an application development software product.

To determine the relative benefits of these three alternatives, Mountain States Life developed identical amortization programs under DMS, command-level Cobol and UFO, Smith said.

"In terms of speed, the clear winner was UFO," Smith maintained. "In DMS, it required four times as much time to develop the same application. In command-level Cobol, a technique with which we were not very experienced, we spent about 10 times as much time."

Smith added that an experienced command-level Cobol staff could have reduced Mountain States Life's experience by two-thirds.

Opportunity to recoup investment

After using UFO for about six months, Mountain States Life had an opportunity to recoup its investment when the company was acquired by Colwell Financial Corp., Smith said.

As the acquisition was in progress, Smith and his staff were inundated by scores of requests for specific information. Some of the inquiries were detailed and comprehensive, for example, a listing of all record fields that had more than \$5 worth of a specific type of insurance coverage in them, he said.

"We could run an executive inquiry under UFO, and it would take us maybe 15 minutes," Smith said. "Before, we would have had to write a program, which, at a minimum, would have taken half a day." The staff uses the executive inquiry function at least once a day, he said.

The tool also helped reconcile the data processing systems of the two companies, Smith said. It helped determine that what appeared to be errors in the mortgage system were not errors at all. "In about a third of the instances, when the Colwell Financial analysts pointed to an 'error' in our system, we ran an executive program in UFO and demonstrated that they were looking at the wrong data," he said. This capability saved literally hundreds of hours of unnecessary effort, Smith said.

In 1983, Mountain States Life acquired UFO/Cobol, a high-level Ansi Cobol-based application development system, because using UFO alone was proving to be too slow for complicated tasks, Smith said. "It takes more time to write procedures in UFO than it does to write a UFO/Cobol program if you are matching two or more files," he said.

Plans call for Mountain States Life to use UFO/Cobol to develop comprehensive life insurance master updates on-line. These updates require an application incorporating five to seven master files stored in Cobol programs.

"We're going to write a claims system for life insurance that will pull up a person's information on a screen," Smith said. The project will give information such as what benefits the person is entitled to, his history and background, he added.

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18 The Ampex 210 is from the Computer Products Division of Ampex Corporation. One of The Signal Companies ☛

Software buying meet set Feb. 8

MADISON, N.J. — Frank Aiello, a partner in the New York law firm of Contino, Ross & Benedict, will conduct a one-day course on software acquisition Feb. 1 at the Hyatt Regency Hotel in Cambridge, Mass. Aiello will also conduct the seminar Feb. 8 at the Doubletree Plaza in Seattle, Feb. 13 at the Radisson Hotel South in Minneapolis and Feb. 22 at the Houston Oaks in Houston.

"Legal Aspects of the Software Acquisition" is sponsored by the American Institute for Professional Education. It will address the software contract, software product definitions, pricing and payment considerations, protection of the user and vendor, warranties and remedies and licensing considerations.

The course fee is \$295. More information is available from the American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940.

NEWS

DPMA group sponsoring two-day software seminar

SUNNYVALE, Calif. — The Education Foundation of the Data Processing Management Association (DPMA) is sponsoring "Managing Software Projects II," a two-day seminar featuring Earl Boebert, project manager in advanced systems software and hardware development at Honeywell, Inc.'s Systems and Research Center.

The two-day seminar is being held at the Sunnyvale Hilton here Feb. 7-8 and at the Doubletree Hotel in Anaheim, Calif., Feb. 25-26.

Boebert, who is also an adjunct professor at the University of Minne-

sota, will cover topics including managing software projects; transition from requirements to design; design, implementation, integration, verification and acceptance; documentation; planning and estimating; and writing the software proposal.

The registration fee is \$495 for DPMA members and \$525 for non-members. Rates for teams of three or more are \$455 each. More information is available from DPMA Education Foundation Seminars, c/o Technology Training Corp., Department MSP, P.O. Box 3608, 3420 Kashiwa St., Torrance, Calif. 90510.

Ansi requesting feedback on proposed draft standards

NEW YORK — The American National Standards Institute (Ansi) is seeking comment on the draft international standards (DIS) on information systems that are currently being considered for approval by the International Standards Organization (ISO).

The ISO DIS include the following: ISO/DIS 1001, information processing — file structure and labeling of magnetic tapes for information interchange; draft addendum ISO 7478/DAD 1, information processing systems, data communications, multi-link procedures; and ISO/DIS 8342,

monochrome test chart for document copying machines — specifications for the chart and its storage envelope.

The standards are priced as follows: ISO/DIS 1001, \$44; ISO 7478/DAD 1 draft addendum, \$14; ISO/DIS 8342, \$20.

They are available from the International Sales Department, Ansi, 1430 Broadway, New York, N.Y. 10018.

Comments on the proposed standards should be forwarded to Ansi's director of operations, Daniel W. Smith.

Henco users set annual meet for Feb. 24-27

NEW ORLEANS — The fourth annual Henco Software, Inc. users conference will be held at the Hyatt Regency here Feb. 24-27.

The conference will feature 20 workshops, 12 tutorial sessions and several special interest group meetings, Henco said. Keynote speaker, W. J. Spiegelhalter, manager of industry marketing at AT&T, will reportedly speak on "Intercity, Interdata Networking."

The conference registration fee before Jan. 21 is \$275. After that date, the fee is \$325.

In addition to the conference, Henco has planned 11 user workshops on Feb. 28 and March 1. Topics include "Application Development Techniques" and "Programming with Info," Henco's data base management package. The workshops are priced from \$100 to \$400.

Henco Software is located at 100 Fifth Ave., Waltham, Mass. 02154.

Three-day meet to examine links

DALLAS — A three-day course on connecting personal computers to mainframes will be held here at the Sheraton Dallas Hotel Feb. 6-8, and at the Boston Park Plaza Hotel Feb. 13-15.

Sponsored by Data-Tech Institute, the course will examine the use of distributed data bases and integrated applications for personal computers and mainframes.

Also to be spotlighted will be local-area networks, personal computer data communications and connecting personal computers to either Digital Equipment Corp.'s Decnet or IBM's Systems Network Architecture.

The course will utilize case studies and will provide each participant with a workbook, the sponsor said. The course costs \$745 per person. More information is available from Data-Tech Institute, P.O. Box 2429, Lakeview Plaza, Clifton, N.J. 07015.

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07:38		MICRO FOCUS HIGH PERFORMANCE LEVEL II COBOL
00:19		PHILON FAST/COBOL

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NEWS



CALENDAR

WEEK OF JAN. 27

JANUARY 28, BURBANK, CALIF. — IMS/ADF. Contact: IMS Consulting, Inc., Suite 305, 16601 Ventura Blvd., Encino, Calif. 91436.

JANUARY 28, NEW YORK — Word Processing with Multimate. Contact: Center for Advanced Data Processing, Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

JANUARY 28, CONCORD, CALIF. — Performance Management in the Systems Environment. Contact: Thomas Bisacchino, Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138.

JANUARY 28-29, LOS ANGELES — Unix Seminar. Contact: U.S. Professional Development Institute, Unix and C, 1620 Elton Road, Silver Spring, Md. 20903.

JANUARY 28-29, NEW YORK — Advanced Report Writing in Focus. Contact: Julie Leonard, Advanced Infrastructures, Inc., 475 Fifth Ave., New York, N.Y. 10017.

JANUARY 28-29, WASHINGTON, D.C. — Operating Systems: A Comparative Analysis. Contact: Data-Tech Institute, P.O. Box 2429, Lakeview Plaza, Clifton, N.J. 07015.

JANUARY 28-30, DALLAS — Relational Data Base. Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

JANUARY 28-30, NEW YORK — Decision Support Systems on Personal Computers. Contact: Institute for Advanced Technology, 6003 Executive Blvd., Rockville, Md. 20852.

JANUARY 28-30, WASHINGTON, D.C. — Personal Computer/Data Communications Systems. Contact: The American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940.

JANUARY 28-30, NEW YORK — Job Control Language. Contact: Chubb Institute, P.O. Box 342, 8 Sylvan Way, Parsippany, N.J. 07054.

JANUARY 28-31, WASHINGTON, D.C. — Communication Networks Conference & Exposition. Contact: CW/Conference Management Group, Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

JANUARY 28-FEBRUARY 1, NEW YORK — Vsam. Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001.

JANUARY 28-FEBRUARY 1, DES MOINES, IOWA — Basic Systems Analysis. Contact: Thomas Bisacchino, Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138.

JANUARY 28-FEBRUARY 1, RALEIGH, N.C. — Advanced C Topics Seminar. Contact: Suzanne Battista, Plum Hall, Inc., 1 Spruce Ave., Car diff, N.J. 08232.

JANUARY 28-FEBRUARY 1, SAN FRANCISCO — Data Base & Systems Design Workshop. Contact: Institute for Advanced Technology, 6003 Executive Blvd., Rockville, Md. 20852.

JANUARY 28-FEBRUARY 1, NEW YORK — CICS Command-Level Programming. Contact: Amdahl Corp., National Education Center, M/ S 302, P.O. Box 3470, 1250 E. Arques

Ave., Sunnyvale, Calif. 94088.

JANUARY 28-FEBRUARY 1, SANTA CLARA, CALIF. — Ada Software Engineering Workshop. Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

JANUARY 29, NEW YORK — Spreadsheets Using Lotus 1-2-3. Contact: Center for Advanced Data Processing, Suite 402, 450 Seventh Ave., New York, N.Y. 10123.

JANUARY 29, HOUSTON — Finite Element Modeling and Analysis. Contact: Valerie Brodsky, Ridge Computers, 2451 Mission College Blvd., Santa Clara, Calif. 95054.

JANUARY 29-31, ORLANDO, FLA. — Successful Implementation of Computer-Integrated Manufacturing. Contact: Sharilyn Shampine, Computer and Automated Systems Association of SME, P.O. Box 930,

One SME Drive, Dearborn, Mich. 48121.

JANUARY 29-31, CHICAGO — SAS Basics. Contact: SAS Institute, Inc., Box 8000, SAS Circle, Cary, N.C. 27511.

JANUARY 29-31, CARY, N.C. — SAS Processing. Contact: SAS Institute, Inc., Box 8000, SAS Circle, Cary, N.C. 27511.

JANUARY 29-31, BOSTON — How to Manage Software Projects. Contact: Ruth Dordick, Integrated Computer Systems, P.O. Box 45405, 6305 Arizona Place, Los Angeles, Calif. 90045.

JANUARY 29-FEBRUARY 1, BAL HARBOUR, FLA. — 1985 American Bankers Association's National Insurance and Protection Conference. Contact: Vicky Barr, American Bankers Association, Security and Risk Management Division,

1120 Connecticut Ave. N.W., Washington, D.C. 20036.

JANUARY 29-FEBRUARY 1, SAN DIEGO — How to be Effective as a Technical Manager. Contact: Ruth Dordick, Integrated Computer Systems, P.O. Box 45405, 6305 Arizona Place, Los Angeles, Calif. 90045.

JANUARY 30-31, SAN JUAN, PUERTO RICO — Pan American Conference and Exposition on Document-Based Information Systems. Contact: International Information Management Congress, P.O. Box 34404, Bethesda, Md. 20817.

JANUARY 30-FEBRUARY 1, PALO ALTO, CALIF. — Networking IBM Personal Computers: Communicating with Mainframes, Local and Public Networks. Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Gary St., Santa Ana, Calif. 92705.

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APRIL 14-18, 1985

DALLAS CONVENTION CENTER

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EDITORIAL

DOD, DP export: Not a good mix

In appearance, it is a watered-down version of the export review procedure President Reagan proposed six months ago after Congress failed to renew the Export Administration Act.

But the president's recent decision to give the Department of Defense "limited" review authority over high-tech export licenses still is unacceptable and inappropriate.

Reagan's order will give the DOD 15 days to review applications for high-tech export licenses, during which the military can recommend approval or denial. Should the Department of Commerce recommend approval of a license application and the DOD recommend denying it, the dispute will be settled by the National Security Council. It's dollars to doughnuts that, if push came to arbitration, the council would be very likely to side with the military, particularly when advising a president so sympathetic to the Pentagon. Therefore the issue of dispute arbitration is hardly moot.

Why shouldn't the military play an active if not decisive role in determining what computers and other high-tech commodities can be shipped abroad? Wouldn't the Pentagon, which itself annually purchases billions of dollars worth of high-tech strategic goods, be the best judge of what U.S. products should be kept out of the hands of Eastern bloc nations?

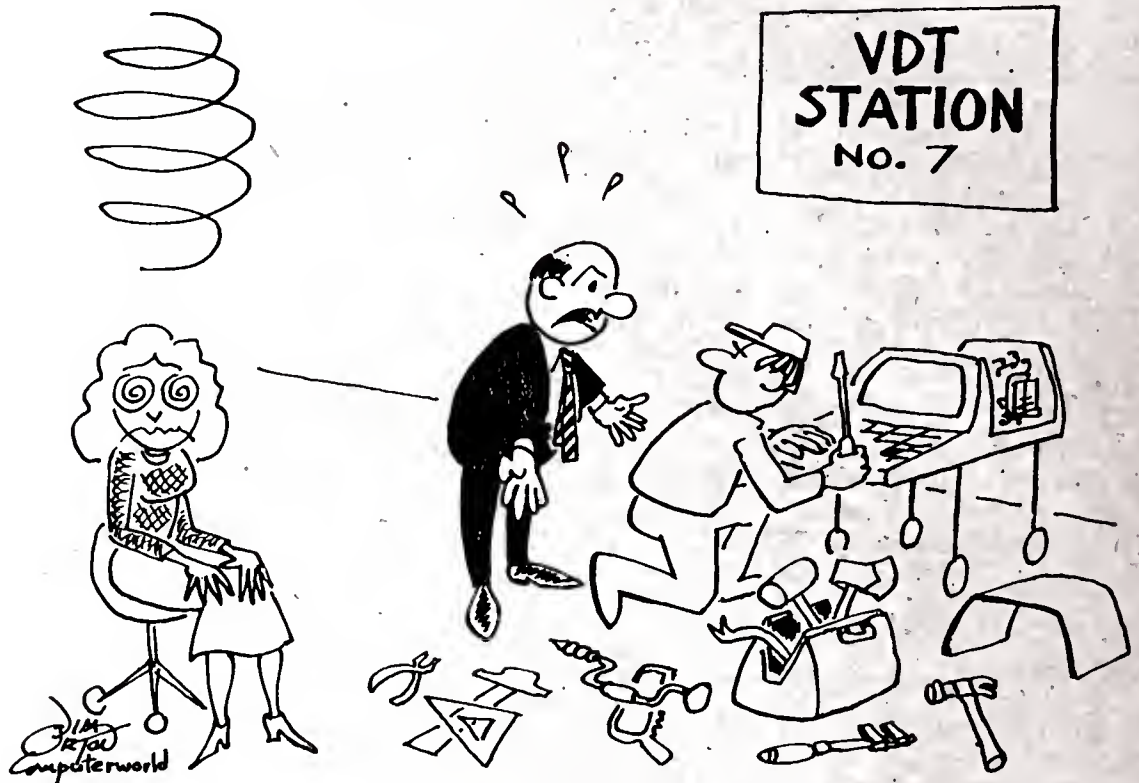
The answer is no, as we have said before in this space. The Pentagon has shown an implacable ability in the past to ignore economic and commercial realities in its zeal to out-manuever the Soviets. Consider the time, early in Reagan's administration, when the Pentagon tried to block the sale of oil pipeline equipment to the Soviets, equipment readily available throughout the world. Remember the time last year when ranking Pentagon officials tried (and failed) to place strict limitations on the export of low-powered micros, pointing to the machines' potential for strategic use on the battlefield — as though 8- and 16-bit microcomputer technology was the sole possession of the U.S.

The broader point is that there already exists an agency, the Department of Commerce, capable of making more reasoned decisions regarding export license review. This department is staffed at the top with Reagan appointees and no doubt shares the president's and the nation's wishes to halt the flow of truly strategic U.S. goods to the Soviets and their allies.

Equally as important, the Commerce Department can more adequately consider the position of small and large businesses in the export control issue, at least as compared with the inherently parochial view of the Pentagon.

The Commerce Department did a good job recently [CW, Jan. 14] in quantifying for small computer manufacturers those product specifications (such as memory capacity and processor speed) that will determine whether a computer shipment need be licensed for export, removing some of the subjectivity from the licensing procedure.

Ultimately, it is Congress' apparent insouciance in the export matter that has given the president the opportunity to implement his own policy. Unfortunately, there are no loud rumblings from Capitol Hill indicating that Congress will seek to regain what it lost through indecision.



'What do you mean, "Whatever's" wrong here, it isn't the equipment?'

LETTER

IBM's JAD only partial solution

The article, "JAD project aids design," describing IBM's joint application design (JAD) methodology [CW, Dec. 24] correctly praised JAD's virtues but omitted to mention its shortcomings.

Like the older design methodologies it seeks to replace, JAD approaches the design process from the DP point of view rather than from the user point of view. This results in the same sort of insistence on technical needs over business needs that has produced inferior application designs in the past.

While JAD may be a practical methodology for designing transaction processing applications, it needs substantial modification to make it an effective tool for designing decision support systems.

An interactive method for designing computer

applications is a necessity if DP is to improve its responsiveness to user computing needs. JAD only takes us part of the way there.

Naomi S. Leventhal
Alexandria, Va.

Computerworld welcomes letters from its readers. Preference will be given to typed, double-spaced letters of 150 words or less; they may be edited for clarity and brevity.

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VIEWPOINT

Time is ripe for 'know-how' machines



**LECHT
ON SCIENCE**
Charles P. Lecht

Part 2 of series

Some of us are terrified that new offerings in computer systems will provide increasing artificial intelligence and will, therefore, be capable of performing more and more things that before only people could do. Not me. I, for one, think it's about time.

The "real" stuff — human intelligence — seems as woefully lacking to me as does our vision, hearing and strength. We need artificial intelligence as much as we need artificial vision (for example, the microscope and telescope) to augment our natural endowments. Without it, our capacity to reason would remain dismally poor. The results achieved by the human intellect in avoiding disastrous conflict in the sociopolitical arena provide us with exemplary evidence of its limitations.

That we fear the takeover of our jobs by computing machines more than we do the loss of our lives by nuclear warfare indicates the quality of the reasoning powers we possess. The creation of systems that would enhance our intellectual powers could help to alleviate such conflict and must, therefore, be accepted as cause for celebration.

Putting aside (but not forgetting) such lofty issues for a moment, I believe the appearance of know-how machine technology will improve the day-to-day quality of our lives. These machines will extend and amplify our intellectual powers — enabling us to reduce waste and chance in our lives. The more intelligence the less toil, and that's what we're after.

Given the capabilities of today's know-how machines, the suggestion arises that they may possess an intellect indistinguishable from that of

some people. We cannot deny the validity of a machine intellect if we judge it by the same standards we apply to the human sort — the results it achieves.

That what a person achieves may not be, strictly speaking, of his own choosing obscures our measurement of the size of his intellectual powers. Nonetheless, the possession of knowledge and the ability to apply it, is recognized only through results. And if the results of a human and a machine are the same in the application of know-how — defined by Webster's Ninth New Collegiate Dictionary to be the "knowledge of how to do something

”

So what if a machine can possess an intellect? Did the world crumble when earlier theories claiming man's usage of tools to be unique among all living creatures were disproven by a chimpanzee?

smoothly and efficiently” — concluding the existence of intellect in a machine isn't too hard to do.

So what if a machine can possess an intellect? Did the world crumble when earlier theories claiming man's usage of tools to be unique among all living creatures were disproven by a chimpanzee?

Arguments about whether machines can know something in the same sense that people do, suffer from chronic semantic difficulties, so I'd like to avoid offering these here. Suffice it to say that I believe they can. And if, at times, this leads me to conclude that certain men may be no more than machines, or that certain machines may be more valuable than some men, I'm not surprised, although I confess to be saddened. Ample proof of this exists; one only need consider the treatment some of us accord our fellow men to put the issue to rest.

We do know that machines can contain knowledge in the same sense that books do. And it doesn't take too great an extension of this to conclude that machines can contain know-how in the same sense that people do.

In its definition, Webster's Dictionary avoids the question of who or what possesses know-how. I suspect that the editors may have wanted to leave the question open, thereby avoiding an onslaught of criticism based upon the possible desanctification of man's presumed anointed earthly role.

Even the definition of the word "know" begs the question of who or what can know. Unraveling the mystery of what was thought on this issue is just about impossible. We are sent from one dictionary entry to another for definitions of "knowledge," "know," "know-how" and their relatives, with only the appearance of the word "intellect" to suggest that a human being may be involved.

I offer this to point out the philosophical problem we shall face as machine technology improves. I predict that as this happens, the possession of knowledge and know-how will prove insufficient in establishing humanness as is the description "tool user." This idea confirms a suspicion I've had for a long time: Only creativity distinguishes a human from beast or machine.

Think of all the things machines now do that once only people did. Railway gate attendant, telegraph operator, courier, ticketing agent, pilot; the list is endless. In addition, there are a lot of things that machines now do that people never could; flying heads the list.

While limited to exhibiting know-how with a physical orientation in the past, current machine technology shows increasing intellectual capacity of the kind previously found only in people. It is hard to find a single thing performed by people that cannot be performed by a machine if possession of knowledge and/or know-how is all that is required. But creativity will always be another matter. It is unique to people.

The marriages of our high-technology companies ("Know-how machines on the horizon," CW, Jan. 7) with those of other industries are bringing

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Lecht is chairman of Lecht Sciences, Inc., a New York-based think tank specializing in computer and communications technologies.



LETTERS

Computer laws reexamined

I concur with the suggestions put forth in "Don't rely on the law to stop computer crime" [CW, Dec. 17] as to nonlegal remedies for computer abuse.

But the authors cite three cases to show how unsatisfactory the law is now. What they do not report is that convictions were obtained in two of those cases.

In *Ward v. Superior Court* (California, 1972), a motion to dismiss the charge against the employee was denied because probable cause existed to indicate that the program was a trade secret under the California statute prohibiting theft of trade secrets. The jury found the defendant guilty.

In *U.S. v. Seidlitz*, the Court of Appeals for the Fourth Circuit upheld the conviction of the defendant on two counts of wire fraud in violation of 18 U.S.C. Section 1343.

While the judge in *New York v. Weg* (New York Superior Court, 1982), did dismiss the case, the fact remains

that many people have been convicted of "computer crime" under statutes enacted before the computer was invented.

I find considerable difficulty with the authors' enthusiasm for the Florida Computer Crime Act of 1981, which they called "the most innovative approach to the computer abuse problem." Innovative perhaps.

However, the authors failed, I believe, to recognize the weaknesses of the statute they praised. Specifically, Section 815.03(3) says, "Computer" means an internally programmed, automatic device that performs data processing." This definition includes not only a computer as most people understand it, but also a digital watch, a calculator and a microwave oven.

Consider this farfetched example: If you were on the beach in Miami and knowingly and without my authorization picked up my watch to find out the time while I was swimming, you would, under the Florida computer crime law, have committed a felony (Section 815.06) and could be sent to prison for five years, fined \$5,000 or both (Sections 775.082 and 775.083).

Obviously this is a ridiculous example, and no intelligent prosecutor would bring such a case. But if the accused were under suspicion of a se-

rious crime, such an act might be enough to give the police an excuse for arrest.

That computer abuse exists is clear. That some changes in the law may be necessary is also true. Massachusetts took a step in this direction in 1983 when it amended the larceny law to define trade secrets to include electronically stored data (Chapter 266, Section 30 (4)). Congress has, as noted by the Finns, taken a step in this direction that may be helpful, although there appear to be ambiguities in the new law.

The problem with specific computer crime legislation is (as it has been since the first statutes in the field were passed) defining the abuse narrowly enough to solve the problem, broadly enough to encompass developing technology and not so broadly that the law covers things like watches and microwave ovens.

Robert Bigelow
Woburn, Mass.

Case against free software

I am writing to protest the recent article "All software should be free, software developer maintains" [CW, Dec. 24] in which Richard Stallman was given a platform to propound his advocacy of "free software" and the

abolition of copyrights.

One need ask Stallman only one question to understand why he endorses such a vague concept as free software. How will software producers live if not by selling the fruits of their labors?

Stallman knows the answer — by government subsidy. You can bet Stallman, spoiled by government-funded academic research programs, longs for the day his kind can dictate the course of the software industry from some ivory tower in Washington D.C.

Stallman claims that the arts and sciences progress "most quickly when people build on each other's work." Yet, how does this work of others come into being in the first place? Does Stallman honestly believe in effects without causes?

No. Stallman's position is an act of moral cowardice to evade the fact that science progresses precisely by the discoveries of independent minds pursuing their own goals and interests. Stallman denies the existence of independent men in order to defend by unspoken implication his own vices — dependence and parasitism.

Allow me to quote the U.S. Constitution on the subject of progress in the arts and sciences: "The Congress shall . . . promote the Progress of Sci-

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LETTER

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ence and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writing and Discoveries."

Stallman's assertions that anyone who will not subordinate his life and work to the unearned benefit of others is an "enemy of society" and that trade is an "offense" to the traders are the type of totally fallacious misconcep-

tions one would expect to see editorialized in some third-rate Marxist tabloid.

Stallman's feeling of "shame" when using the products of software companies reveals a fundamental hatred for the pride of the creators of these products, and consequently, a hatred for man's highest faculty, his creative mind. There is no more evil doctrine, and no "golden rule" will ever justify it.

This man brazenly pro-

poses to "interfere as much as [he] can with other people's attempts to interfere with the sharing of software." In other words, he intends to obstruct enforcement of the copyright laws. Obstruction of justice, which Stallman apparently doesn't realize, is a felony.

In closing, I vow to seek every legal remedy from this man should he ever steal any of my company's software products.

Thomas A. Murphy
Roseville, Mich.

VIEWPOINT

User: Mims the word

I would like to introduce Ken Zearfoss (author of "DBMS role in fourth-generation languages" [CW, Dec. 17]) to the Mims fourth-generation language and data base management system.

Mims was first marketed in 1976 and has been in use here at Dictaphone Corp. since 1978. Mims is a product of General Electric Information Services Co. (Geiso).

Mims allows its user to define the logical unit of work which, in Zearfoss' example, would ensure that if the transfer of \$1,000 from one account into 10 accounts of \$100 each could not be completed in its entirety as one task, then no piece of the transaction would take place.

The dynamic back-out concept is used to make certain that the task is either processed or not processed as a whole, thus ensuring the integrity of the data base.

Since Mims allows for the definition of a logical unit of work, it is also able to lock out all 11 account records in Zearfoss' example from other users until the whole task has been completed. Therefore, other users are assured of a consistent picture of the data base.

I think Zearfoss should investigate the characteristics of Geisco's Mims.

I'm confident he will find that Mims has provided what he feels are the missing DBMS capabilities in a fourth-generation language.

Pamela K. Farley
Melbourne, Florida

KNOW

from page 39

the "know" and the "how" of doing things together. Born of these marriages will be systems products containing know-how — know-how machines. They will join us as decision makers, financial analysts, doctors, inventory managers, farmers and lawyers.

By off-loading the burdensome parts of our jobs to these machines, we'll become freer to exercise our unique capability to be creative and increase our pleasure in the process of living. That's what it's all about, isn't it?



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SOFTWARE & SERVICES

Kodak's Midss zooms in on DSS role

ROCHESTER, N.Y. — Eastman Kodak Co. stopped counting the benefits of a new decision support system (DSS) barely one year after it was implemented two years ago. The project had already saved more than its \$1.2 million start-up cost.

What made the Market Intelligence DSS (Midss) so successful was painstaking planning and an approach by the system's implementors that stressed conceptual rather than numeric goals. Kodak's installation of Midss was preceded by months of soul-searching concerning the question of just what the system should do, according to Fred Brachman, DSS director in market intelligence at Kodak.

The key functions that Kodak ultimately defined related little to statistical analysis or multidimensional modeling. Midss was designed to assess information need; measure the marketplace; store, retrieve and display data; analyze market information; and evaluate impact.

Interviewed recently about Midss, Brachman talked largely about the need to view DSS in a different light from traditional information systems. "DSS is about planning based on assumptions and risks based on those assumptions," he said. "The role of DSS is to look at strategies, as-

sumptions and claims and to use DSS to formulate support and rebuttals for them."

Brachman stressed that DSS is different from the input, processing and output function of information systems (IS). "The real challenge is filtering out the necessary information," he said. "That's not an IS task. It's a matter of getting knowledgeable people together to identify [that information]."

Kodak has drawn heavily on decision-making techniques to design and maintain Midss. Strategic Assumption Surfacing and Testing methods were used to identify critical functions followed by Kepner-Tregoe decision-making techniques.

What types of information?

Kodak has also used the Critical Success Factor approach to decide what kinds of information the DSS should provide and what software should be used.

Brachman's staff interviewed 30 people from different parts of the company to generate the primary list of needs. The consulting firm of Index Systems, Inc. was

later hired to provide information systems consulting services to help organize the procedure, and a data base from Real Decisions Corp. was used to compile an inventory of software suppliers that met the criteria that Kodak identified for its DSS.

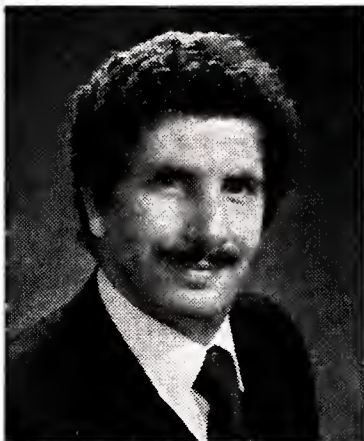
Kodak eventually selected Management Decision Systems, Inc.'s (MDS) Express DSS. The key factors in the decision were MDS' performance against a benchmark and the company's consulting experience, Brachman said. There are more than 100 active Express users within the company.

But Brachman believes in offering users a choice. Midss also includes SAS Institute, Inc.'s SAS and SAS/Graph, Execucom Systems Corp.'s IFPS, IBM's APL and APL/DI and programs written in Fortran.

Accommodate different preferences

The variety of software is intended to accommodate the preferences of different user groups, he said. The quantitative methods people, for example, were comfortable with SAS while the finance group had been using IFPS for two years.

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Brachman

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■ A new package from Virtual Microsystems, Inc. allows Microsoft Corp.'s MS-DOS to run on Data General Corp. minicomputers/48

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Arrival of ISPF version: VM blessing or burden?



SOFTALK
Paul Gillin
CW Senior Editor

IBM's recent announcement of a version of its ISPF dialog manager for the VM operating system [CW, Dec. 10] is a further affirmation of ISPF's importance as a strategic IBM product but a decidedly mixed bag for VM users.

The newest release gives VM users — who are among the most fiercely loyal yet outspoken group of IBM customers — an improved version of IBM's popular dialog manager, but fails to address the stepchild image that VM has come to have within the IBM operating system community.

When taken with similar announcements for MVS/TSO and DOS/VSE over the last couple of years, this means that ISPF applications can now be fully portable across operating system lines. However, the move also indicates that VM users will come under increasing pressure to license ISPF, even though superior products for dialog management are available elsewhere.

"I think the number of products that IBM is going to release that use ISPF interfaces is going to continue to increase to the point that it will

almost be a prerequisite for MVS, VM and VSE shops," said Ross Pavlac, lead programmer/analyst in applications support at the First National Bank of Chicago and manager of the ISPF project at the Guide IBM users group.

ISPF Release 2 Version 1 does make better use of some of the unique facilities that are already available in VM. The problem with the previous release of ISPF was that it looked too much like a shoe-horned version of the TSO product, users said. Gary Schulz, director of computer services at Northwest Industries, Inc. and a user of both VM and ISPF, said, "A typical example was ISPF's use of libraries. It used to be that all panels, messages and skeletons had to be kept in a Mac-lib. A VM user would rather use a Syslib."

The release also allows Xedit, the VM editor, to be used instead of the ISPF editor, an option many VM users will embrace. The product now supports CMS sequential files and the CMS Rexx interpreter language, which is on its way to replacing the Exec command processor under VM. "It's a major step in the right direction," Schulz said. "Whether it will get the VM community on the ISPF bandwagon I don't know."

Many VM users may agree with The Adesse Corp.'s Tom Foth.

See ISPF page 51

SOFTLINE/WILLIAM H. INMON

Information engineering to link data, processes

Today's information engineering discipline must encompass a broader audience and proceed from both the top down and bottom up. In this second part of a two-part Softline, Inmon looks at the future of information engineering.

An interesting shift in attitudes has occurred from the earliest attempts at information engineering to the present. The first attempts centered on data processing's understanding of systems. However, because data processing exists to service a user, a fundamental understanding of the user's environment is required to determine just how stable a system will be. This understanding allows the information engineer to recognize where commonalities occur both in data and in processing. User involvement is an essential ingredient in the modeling process.

The final blueprint of the integrated environment must be a communications tool for the information engineer, management, the user, the programmer and the data base designer. Without the users'

active and sincere support and understanding, the information blueprint will inevitably become a technical back room exercise and fail.

Another changing attitude addresses how long an information engineering effort should take. In the early days, IBM used its Business Systems Planning Process (BSP) to accomplish much of what today's methodologies do. But a BSP was typically cumbersome, required many resources to execute and took an inordinate amount of time. It was a common phenomenon for a BSP to be abandoned after four or five months, when only a fraction of it had been executed.

To be effective, an information engineering methodology must be executed in a finite amount of time (preferably six months or less) with a finite number of resources. Another success factor is the audience that can execute information engineering. To be applied across a wide audience, the execution of an effective methodology must be appropriate to someone with a reasonable data processing/user background. If a methodology requires 15 years' experience and a doctorate degree to execute, it will never become popular. For these reasons, information engineering methodologies have become much more streamlined and simplified.

Like the pendulum swinging be-

See INFO page 51

Inmon is a director at Coopers & Lybrand in Denver, a noted author on the subject of data base design and a regular contributor to Softline.

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For comprehensive micro-level Decision Support we offer **SeriesOnePlus™***. **SeriesOnePlus** includes file management, spreadsheet, graphics, reporting and word processing components that are all integrated through a unique "BUS" architecture. Because the system is designed exclusively for business situations, **SeriesOnePlus** complements any mainframe-micro network strategy.

#8 Mainframe Decision Support Software

The recently introduced **MANAGE USER SERIES™** provides powerful Decision Support capabilities for the mainframe user. The **MANAGE USER SERIES** combines graphics, text processing and application development tools to enhance the use and display of corporate data.

#9 Client Support

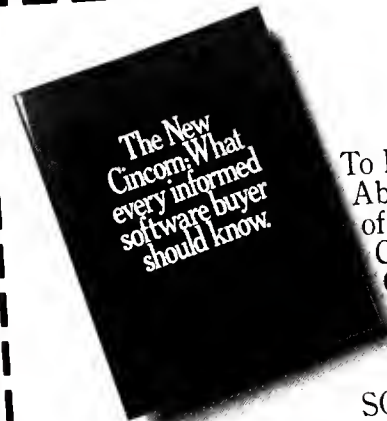
The one thing that isn't new about Cincom is our unrivaled commitment to service, support and user education. When you choose Cincom you can be assured of the highest caliber of support.

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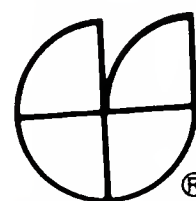


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SYSTEMS SOFTWARE**INTERACTIVE SYSTEMS, INC.****Clone**

Interactive Systems, Inc. (ISI) has announced the Clone conversion package, which ISI developed in conjunction with Digital Equipment Corp. The ISI syntax conversion package is said to facilitate conversion of Dec-

system-10 and Decsystem-20 Cobol code to VAX-11 Cobol.

According to a spokesman, Clone was designed to aid in the migration of application code from one operating system to another. With Clone, standard parameter files analyze 36-bit Cobol-74 programs within Decsystem-10 and Decsystem-20 files to assist in their migration to a VAX-11 Cobol environment.

Clone provides facilities for application syntax conversion, application library

access, translated application code, documentation of all code changes, data name replacement, optional warning messages and application code insertion.

Clone is priced at \$750.

Interactive Systems, 600 Suffolk St., Lowell, Mass. 01854.

BOOLE & BABBAGE, INC. Release 1.1, IMF/SM

Boole & Babbage, Inc. has announced a version of its IMF/System Manager (IMF/SM), which supports IBM's IMS/VS 1.2 or IMS/VS 1.3 environments on IBM CPUs running under IBM's MVS or MVS/XA operating systems.

According to a spokesman, IMF/SM provides a method for controlling IMS/VS resources in an interactive, structured programming facility-like manner. It can automatically start; stop or reassign IMS/VS resources to assure optimal use of resources and the fulfillment of service-level objectives.

All IMS/VS master terminal operator and IMF/SM messages are written to a Dasd log that may be viewed interactively by an IMF/SM user, the vendor said. IMF/SM Release 1.1, which replaces Release 1.0.3, is available to all IMF/SM customers with current maintenance agreements.

The price of IMF/SM is \$32,500 for the first site, first CPU.

Boole & Babbage, 510 Oakmead Pkwy., Sunnyvale, Calif. 94086.

BMC SOFTWARE, INC. Delta IMS

BMC Software, Inc. has announced a software package that allows IBM IMS installations to configure to on-line IMS/VS environments.

Delta IMS provides for the interactive addition and change of all commonly modified IMS resources and allows data bases, application programs, transactions and IBM Vtm terminals to be added and modified, a spokesman said.

The system is said to eliminate the batch-oriented IBM IMS generation procedure, and it includes full screen panels to prompt the user, as well as on-line error detection and help facility. It is priced at \$25,000 for a perpetual lease, or \$1,250/mo.

BMC Software, P.O. Box 2002, Sugar Land, Texas 77478.

APPLIED DATA RESEARCH, INC. Micro/mainframe products for IBM 3270

Applied Data Research, Inc. (ADR) has announced that its micro/mainframe software products will operate on the IBM 3270 Personal Computer Workstation.

Continued on page 48

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APS/IMS is the application productivity system that for the first time, offers a strategic solution for IMS DB/DC and CICS/DLI users.

With APS/IMS, you won't have to settle for a development tool that meets just a few of your productivity requirements. APS/IMS incorporates screen and application "painting," prototyping capabilities, and procedural and macro language support into a single, integrated architecture. With APS/IMS, your development staff can design, prototype and implement batch and online applications in a fraction of the traditional time and cost—without sacrificing performance or functionality.

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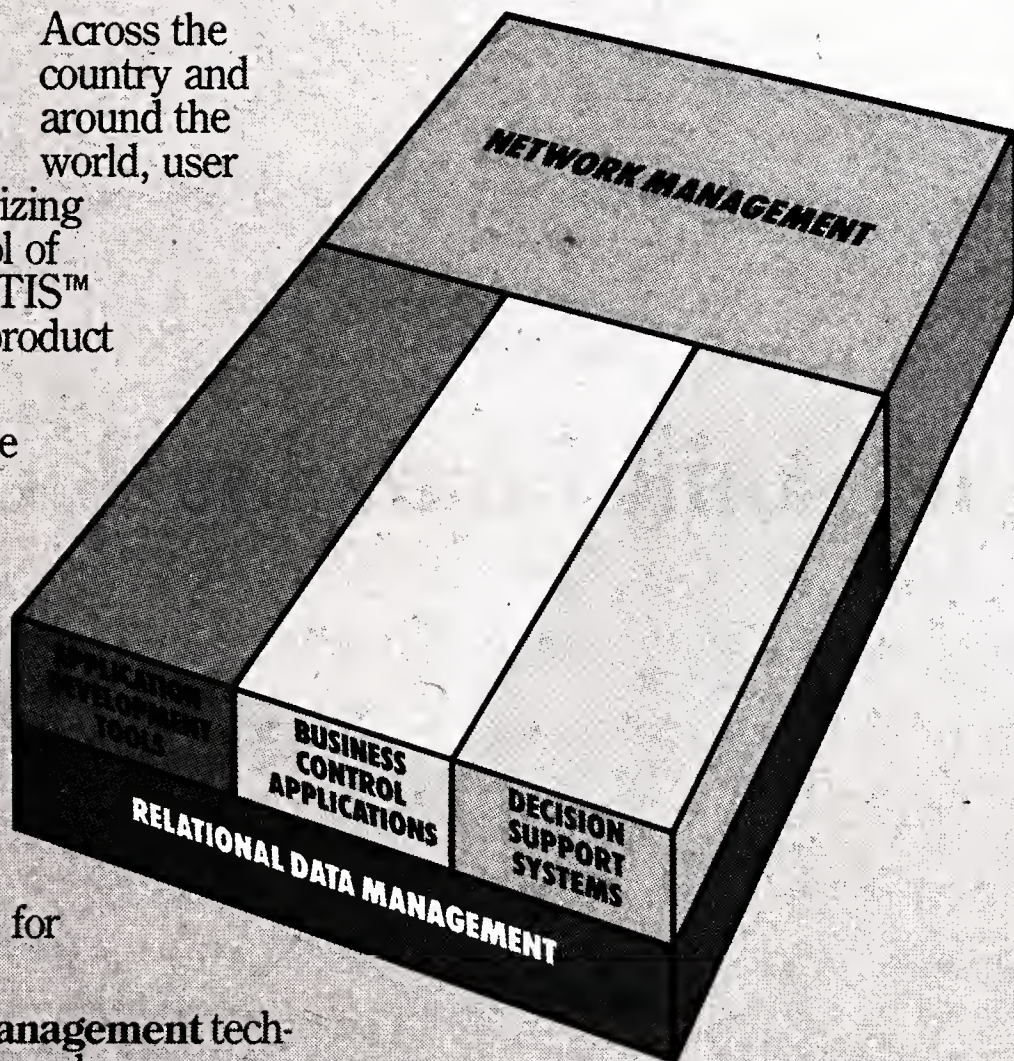


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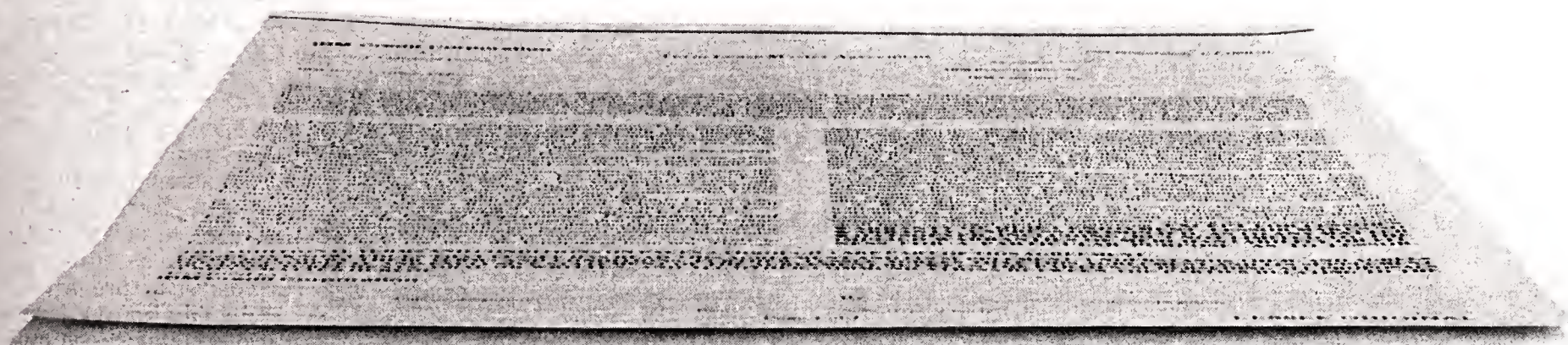
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WESTWOOD
COMPUTER CORPORATION

SOFTWARE & SERVICES

Continued from page 44

According to a company spokesman, ADR/PC Datacom Version 2.0 permits data sharing between IBM 3270-PC workstations and IBM mainframes. ADR/PC E-Mail reportedly can upload electronic mail messages to the mainframe for distribution. Mail generated on the mainframe or by IBM Personal Computer users can be downloaded for local management.

Both products are priced at \$500 and will be available

in the first quarter, a spokesman said.

ADR/PC Personal Terminal Environment is said to provide an integrated connection to ADR's Roscoe, Volle and Librarian products to provide 3270-PC support for both the OS/MVS and DOS/VSE environments.

The product is priced at \$500 and will be available in the second quarter, according to the vendor.

ADR, Rt. 206, Orchard Road, Princeton, N.J. 08540.

ROSS SYSTEMS, INC. Maps/Microlink

Ross Systems, Inc. has introduced a software bridge between IBM Personal Computer-based spreadsheets and Digital Equipment Corp. VAX superminicomputers.

Maps/Microlink reportedly enables Personal Computer-based spreadsheets to share data with the vendor's accounting and decision-support applications on VAX systems.

The program was designed to integrate with the vendor's Maps/Model, a financial modeling package, and Maps/GL, a general ledger program.

Communications modules within Maps/Microlink are said to run independently on the Personal Computer and the VAX, providing error-free, two-way communications between computers.

Maps/Microlink is priced at \$10,000.

Ross Systems, 1860 Embarcadero Road, Palo Alto, Calif. 94303.

COMMUNICATIONS CONSULTING CORP. Lifdos

Communications Consulting Corp. has introduced a package of two utility programs for Hewlett-Packard Co. Model 9000 Series 200 or HP Model 9020 Series 500 computers under HP's Basic 2.0 or 3.0 operating system.

According to a spokesman, the Lifdos package consists of a Copy program and an Editor program. Copy allows for the transfer of Ascii format programs between the HP Logical Interface Format (LIF) disk format and the Microsoft Corp. MS-DOS operating system disk format of the HP 150 microcomputer. The HP 9000 can catalog, erase, purge and transfer Ascii files from the Model 150 to a member of the HP 9000 family and back.

The spokesman said Editor gives the HP 9000 Series 200 or HP 9020 the ability to read Ascii files and store them as a string into memory. The editing features of the HP 9000 may then be used to manipulate the files and to transfer programs and their translation between the HP Series 100 and the HP 9000 computers.

The Lifdos software is priced at \$600 for both Copy and Editor.

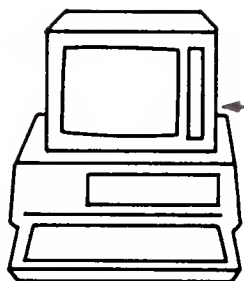
Communications Consulting, 52 Hillcrest Drive, Upper Saddle River, N.J. 07458.

VIRTUAL MICROSYSTEMS, INC. The Bridge

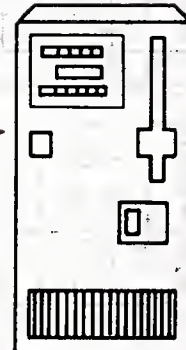
Virtual Microsystems, Inc. has announced a Microsoft Corp. MS-DOS option for Data General Corp.'s Eclipse and MV family of minis.

According to a company spokesman, The Bridge sys-

PC to System 34/36/38 Local Communications



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For configuration flexibility, AST-5251/11 provides host addressable 5256 printer support and can effectively utilize low-cost PC-compatible printers. Options include

file transfer and an application program interface for integrating PC and host applications.

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- Provides host-addressable 5256 printer support on PC-attached printer.
- Selectable DMA and I/O interrupt channels.
- Application program interface and bidirectional file transfer available.
- Complete package includes hardware, software, twinax cable assembly, and comprehensive user manual.
- Hot-Key assist for concurrent host and PC sessions.

AST-5251/11 and AST-5251/12 trademarks of AST Research, Inc. AST-5251/12 is a development of AST Research, Inc. and Software Systems, Inc., Jefferson City, MO. IBM registered trademark of International Business Machines Corp.

SOFTWARE & SERVICES

tem is a hardware and software combination that reportedly allows terminals connected to the host minicomputer to appear as a dedicated microcomputer. Distributed processing is facilitated by shared program and data files, according to the vendor.

The price of the The Bridge for a four-user MS-DOS system on a DG AOS operating system is \$7,700. Prices vary depending on the operating system and memory capacity, the vendor said.

Virtual Microsystems, 2150 Shattuck Ave., Berkeley, Calif. 94704.

ADVENT ONLINE KNOWLEDGE ESP, ESP.2 and Personal Calculator

Advent Online Knowledge has introduced three products for Prime Computer, Inc. Series 50 computers under Prime's Primos operating system.

According to a spokesman, Extra-Sensory Perception (ESP) enables a system administrator to monitor the activities of a selected terminal user or scan the activities of all terminal users on a system. ESP.2 enables the system administrator to capture all prelogon activities of selected dial-up and direct-connect lines in a file.

Personal Calculator is a visual calculator that works either in stand-alone mode or as a subroutine call from another application program. It will display a calculator image on the screen and optionally simulate a paper tape. The Personal Calculator program works with many popular video terminals, the vendor said.

The price of ESP and ESP.2 is \$395 each or \$695 for both packages. Personal Calculator is priced at \$295.

Advent Online Knowledge, Suite 133, 1305 Wiley Road, Schaumburg, Ill. 60195.

THE BRIDGE, INC. Keyplus

The Bridge, Inc. has announced that it has obtained exclusive North American marketing rights to Info-link Australia, Pty. Ltd.'s Keyplus IBM Vtam-based data entry system. The package was designed for use on IBM mainframes running under IBM's OS, DOS and MVS operating systems.

According to a company spokesman, the package works directly with Vtam without the need for any other teleprocessing monitor. Its on-line approach allows data entry applications to be developed and maintained with no programmer intervention. The system works with standard IBM 3270-type terminals.

Keyplus features English commands supplemented by program function keys, menus and Help facilities. Users can design their own informational and Help screens to explain particular data entry standards and requirements.

Pricing for Keyplus begins at \$11,500 for DOS and \$16,500 for OS and MVS.

The Bridge, 199 California St., Millbrae, Calif. 94030.

PENTA GROUP, INC.

Penta Quik, Penta Key, Penta Time

Penta Group, Inc. has introduced three utilities for Digital Equipment Corp. computers running under DEC's RSTS/E operating system.

According to a spokesman, Penta Quik is a start-up utility that sets

runtime systems, libraries, logicals and concise command language commands in about 15 sec. Penta Key, another start-up utility, sets up to 256 terminals, including pseudokeyboards, in about 15 sec.

Penta Time is said to be an on-line, time-limit program that monitors the runtime of jobs and removes any job that exceeds its parameters. It occupies one job slot and runs in 4K bytes of memory.

The utilities are priced at about \$350 each.

Penta Group, 127 E. 59th St., New York, N. Y. 10022.

H&A COMPUTER SYSTEMS, INC. EXB-Backup Utilities; Exedit

H&A Computer Systems, Inc. has announced that it has reorganized its

utilities packages for the IBM Series/1 minicomputer running under IBM's EDX operating system.

H&A's Exdump and Exrestor utilities have been combined with automatic initialization into a package named EXB-Backup Utilities. The utility package allows a single file to span multiple diskettes and can be run from a job stream with no operator intervention. It compresses data, will optionally print a backup log report and provides protection against writing over a hard-disk file.

The company also released an enhanced version of Exedit for the IBM Series/1 that offers added support for IBM 4978, 4980 and 3101 block-mode terminals. The package will restrict the CHANGE and FIND commands to a specified range of positions. COPY and MOVE commands will now hold the screen in

place and the cursor can be sent to any position on the current line, the vendor said.

The price of EXB-Backup Utilities is \$790, and the price of Exedit is \$590.

H&A Computer Systems, Suite 204, 30 Hotaling Place, San Francisco, Calif. 94111.

MICHAELS, ROSS & COLE, LTD. Mrc-Summarizer

Michaels, Ross & Cole, Ltd. has introduced a summarizer for use with IBM System/38 processors.

The Mrc-Summarizer is said to relationally access data base information. It reportedly includes shared access path logic and an automatic Programming Request for Price Quotation interface that allows informa-

Continued on page 50

CSR Training: Rx for MVS/XA Headaches.

Unnecessary VTOC searches, poor TSO response time, excessive channel busy... they all cause a migraine for systems programmers and DP managers. Get quick relief with MVS/SP/XA training. Compiled by Computer Systems Research and Yale University's Howard Gilbert, this unique self-study material offers the most complete, in-depth MVS Internals training available.

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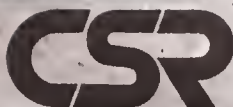
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See how it pays for itself.

Find out more about the Rx for your MVS/SP/XA headaches. Call or write for an evaluation module to use free. We'll also send you a free cost analysis sheet that'll show you how only a 1 or 2% increase in MVS efficiency can pay for CSR Training and more.



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Developers of the IBM Personal Computer Instructional System.

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TSO/VTOC/JES/
CICS/IMS/TSO/
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SOFTWARE & SERVICES

Continued from page 49

tion to be downloaded to a personal computer, the company said.

According to the company, the product allows users to access System/38 data base files and specify the information they would like to extract.

Calculated fields can be defined and included in the summarized files.

Help key documentation, multilevel security and relational file joining are also in-

cluded, according to the vendor.

The product is licensed for \$1,140/module per site, a spokesman said.

Michaels, Ross & Cole, P.O. Box 4533, Oak Brook, Ill. 60521.

MULTIPLICATIONS SOFTWARE, INC. Imagine 1.2

Data base access has been added in the latest release of Multiplications Software,

Inc.'s on-line query and reporting system for IBM's DOS/VSE, DOS/MVT, OS/MVS and OS/VS1 operating systems.

According to the company, Imagine 1.2 provides the ability to create an information data base out of production data files.

The product allows users to define customized access paths to any data base management system file type using a user exit, the company said.

Base price of the product is \$25,000 and can range up to \$60,000 depending on the processor and operating system.

Multiplications Software, 1050 Massachusetts Ave., Cambridge, Mass. 02138.

PBL ASSOCIATES Tapmap

PBL Associates has introduced a software package said to create and update system documentation for Tan-

dem Corp. mainframes and superminicomputers.

According to a spokesman, Tapmap can produce consolidated documentation about multiple systems or can report on one part of a single system. The package reads the source code and creates data files used to generate reports on system file users.

The reports also provide references on all program-to-program and program-to-file interactions.

Tapmap is priced at \$3,000.

PBL Associates, 10 Cottage Ave., Point Richmond, Calif. 94801.

PYRAMID TECHNOLOGY CORP. OS Enhancements

Pyramid Technology Corp. has announced that it has incorporated AT&T's Unix System V 2.0 into its OS operating system for Pyramid's 90 series superminicomputers.

Pyramid's OS is a dual port of the two major implementations of the Unix system — System V from AT&T and 4.2BSD from the University of California at Berkeley.

The new version offers system accounting and independent scheduling of jobs by each user.

The system will be available in the first quarter of this year.

There is no fee for upgrading to the enhanced version of OS.

Pyramid Technology, 1295 Charleston Road, Mountain View, Calif. 94043.

GEJAC, INC. Hasp

Gejac, Inc. has announced a Digital Equipment Corp. VAX-11/VMS version of its Hasp communications software.

Hasp is a generalized communications package that accommodates connection with mainframes, minicomputers and networks for bulk transfers such as copying files or remote job entry (RJE), the vendor said.

Hasp functions include the RJE Host Functionality Option, support for the DMF-32 multifunction board for VAX/VMS systems and support for automatic dialing.

The price of a VAX/VMS license for Hasp is \$5,500, according to the vendor.

Gejac, P.O. Box 188, Riverdale, Md. 20737.

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Information Systems Group



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"O.K. Dave, take a break."

SOFTWARE & SERVICES

INFO from page 41

tween processes and data, so the pendulum swings between top-down and bottom-up approaches. Both approaches have their merits. A top-down approach is appealing because the basic organization of the system becomes apparent, all parts of the integrated system are identified and common parts of the systems can be combined. But a pure top-down approach often leaves out much detail that is necessary for implementation.

A bottom-up approach, on the other hand, ensures that all detail is discovered. But there are major drawbacks to a pure bottom-up approach. For one thing, it often becomes so entangled with details that major parts of the system go undefined. A bottom-up approach often deals with users at a level that only addresses today's — not tomorrow's — needs. It often involves collecting and assimilating a tremendous amount of redundant detail.

Loss of perspective

A final and perhaps most significant drawback of the bottom-up approach is the loss of perspective. When building systems from the bottom up, it is usually very difficult to envision how major parts of the system relate.

Effective information engineering methodologies combine both top-down and bottom-up approaches. The initial understanding of the engineered, integrated system is devised in a top-down fashion. Here, the basic structure of the components is identified, as are all of the components. Once the top-down design has given the architecture its basic form, the bottom-up analysis is done to complete the detail of the architecture. Bottom-up analysis is done strategically, avoiding the redundancy and other problems of a pure bottom-up approach.

Today's information engineer must also realize that the designing of the architecture is not a one-time activity. Every user's environment changes over time. And as the environment changes, so the integrated architecture must change.

If the blueprint has been constructed properly from the outset, then users' changes will have a minimum impact. But in every circumstance, the integrated, engineered environment requires periodic refinement. So information engineering becomes an ongoing activity.

An information engineer is not a data processing person, a user or a manager. He is all of these things. While this may be apparent to the information engineer, it usually is not so obvious to the organization. The effective placement of the information engineer in the organization chart is an important task.

Unfortunately, there are few precedents for effective placement. Information engineers are sometimes placed with capacity planners, with data administration — sometimes considered a subfunction of information engineering — and with data processing steering committees and the like. While each position has its advantages, there are distinct disadvantages as well. The information engineer represents a discipline that crosses traditional organizational boundaries and, as such, is usually an organizational misfit.

While information engineering

has been evolving for some time, it is in no sense finished. Future improvements will continue in software.

Another area of improvement will be in the further simplification and streamlining of the information engineering process. Today's techniques are unquestionably more direct and efficient than yesterday's, but there is still a ways to go.

The final major direction will be a strengthening of the ties between data and processes. While the pendulum has swung toward a balanced approach, the background of information engineering remains, and that background was fostered in an environment of extremes. One extreme recognized the importance of processes. Unfortunately, the founding fathers of each extreme did little to foster a middle ground, which, in today's environment, is a necessity.

ISPF from page 41

"This is more of an insult to VM users than anything else," he said. Foth is bothered that new releases of ISPF for VM have failed to track releases of the operating system itself. For example, Rexxs have been available for a year but are only supported in the latest ISPF release.

Anyway, many VM users would just as soon do without ISPF. IBM already has better dialog managers in its Display Management System and Interactive Map Definition facility of GDDM. ISPF is generally considered to be the most resource-hungry of the three options.

"It looks to me like [this release] will still be I/O intensive, although IBM has said it reduced many of the CPU pathways," Schulz said. "But our performance problems with ISPF

in the past have been I/O problems, not CPU problems."

The use of ISPF could be a benefit if the vendor community starts to respond with ISPF applications that run under both MVS and VM. However, there are no indications that that is happening. In the meantime, VM users are heading for a situation in which they may soon be supporting a dialog manager they do not use simply to be compatible with new program products from IBM.

ISPF still has many fans who praise it for easing dramatically the process of designing and testing input panels. Its validation facilities are good enough to remove a lot of tedious testing procedures and to cut lines of code. Pavlac estimated that ISPF can knock 20% to 30% off the amount of code needed to write an average on-line application.

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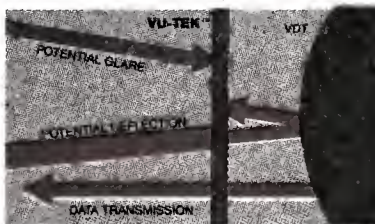
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*National Institute For Occupational Safety and Health Study, August 1981.

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SOFTWARE & SERVICES

DSS from page 41

"If you get into a product push mentality it won't work," he said. "You want to integrate the knowledge of the group, and you need an architecture that allows it."

A key to getting DSS off the ground successfully was selecting target applications. The projects selected had to offer a high payoff and had to address a problem that could not be solved easily with standard data processing methods, Brachman said.

An advertising model was built first. Using demographic information and detailed surveys of consumer buying patterns, the model helps to assess the effectiveness of Kodak's advertising plans. In one case, it saved \$5 million in unnecessary advertising costs, he said.

Applications currently in use also cover pricing and product design decisions and perform analyses on target markets. The largest application is a marketing model that tracks consumer buying behavior and relates it to film purchases and processing. Cost savings from the model exceeded the cost of the DSS by 10 times in the first year alone, Brachman said.

Kodak also uses DSS to target products to key markets, identify ad-

Critical Success Factors Kodak Decision Support System (DSS)	
1982	
- Identify software - Develop application expertise - Obtain management sponsorship - Set up computer-to-computer communications - Select target applications	
1983	
- Training - Continue developing application expertise - Continue management sponsorship - Identify target users - Position products and services	
1984	
- Develop data bases - Develop data stewards	
1985	
- Mainframe shared data bases - Micro-based analysis linked to mainframe data bases - National networking - Data base administration - Data base stewards - Training (micros, demographics)	
1986	
- Integrated DSS tools and data - Worldwide networking	

CW CHART

vertising media, estimate the size of the field sales force and outline sales territory boundaries.

Brachman emphasized that a successful DSS needs the support of both DP and top management. Data base administrators in particular must endorse the system because they will be largely responsible for defining data bases continually, he said.

End users get free rein in Kodak DSS construction

ROCHESTER, N.Y. — Decision support systems (DSS) are for end users, and in building its own DSS, Eastman Kodak Co. has tried to give the users as much free rein as possible.

Kodak's DSS network is supported by about a dozen specialists, or 15% of the user base, explained Fred Brachman, DSS director in market intelligence. However, many user departments support their own data and applications needs, he continued.

At the heart of the system is the concept of "data base stewards." Brachman explained that their responsibility is similar to that of a quality assurance agent in a factory.

Designated stewards

Large departments not only do all their own data entry but have designated stewards who are responsible for ensuring the appropriate use and accuracy of information.

"This avoids the problem where a team builds a model that produces the required results but has design flaws," he said.

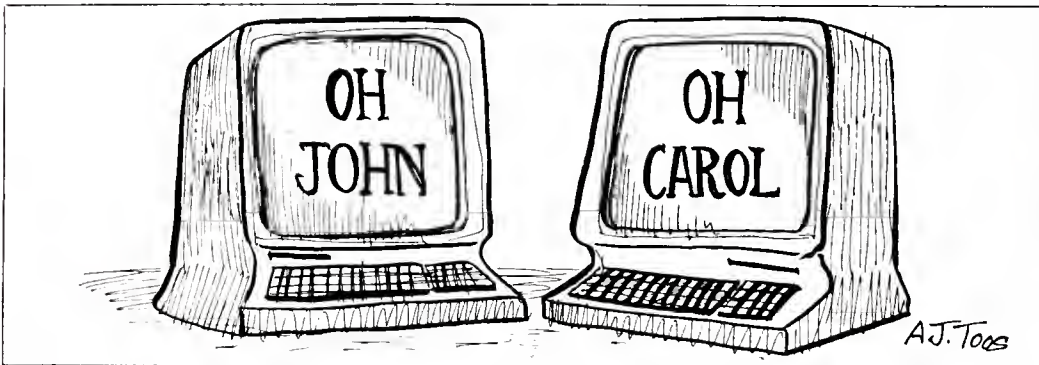
Kodak has also moved much of the support effort for its DSS out to the user departments. The DSS support group is usually 15% of the size of the user base being served, Brachman noted.

"As soon as a user organization gets too large in terms of applications, I break off a specialist to support them," he said. The specialist works in the user department and can call on data processing and other user departments for help.

The arrangement has required a fairly structured training process. Asserting that the training position was "the first job I filled," Brachman said he brought in a person with background in several programming languages as well as teaching to conduct traditional classroom sessions. However, formal introductory courses are no longer offered.

"We decided early on that training had to be available when needed," he said.

"CAI [computer-aided instruction] has been that answer to that need. We now do as much work in CAI as possible," Brachman reported.



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- Requires no modifications to CICS

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- Allocates/deallocates files by groups
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Forms™ screen painter generates source code for interactive displays. It lets you paint full-size text and input screens, and it generates the code directly into your application. Forms is invoked from the Editor as part of the program coding activity, and it includes *diagram drawing* with return text to Editor and vice versa.

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A newly available add-on option, CO-Graphics brings full graphics generation to the COBOL programmer on the PC. Now, your COBOL applications can produce easy-to-understand charts and graphs. Programmers with little graphics knowledge can produce graphics easily through a simple CALL interface from the COBOL program.

CO-Graphics lets you: draw graphics primitives or objects including text, bars, circles, arcs, and pie slices; define attributes such as color fill, line style, and line width; display text in various sizes, fonts, colors, and locations; process input from mouse devices, keyboards, and graphics tablets; and take advantage of the VDI standard for device independence for graphics output on printers or plotters.

The advanced programming aids such as Animator in Professional COBOL can be used in the development and debugging of graphics application programs. CO-Graphics incorporates GSS Drivers™.

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FOR PROGRAMMERS

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An Independent View

"The most significant thing I found, that I found nowhere else, is something I'm going to call the Micro Focus COBOL Environment. Once you have your system loaded and you enter COBOL, you're never looking at the operating system anymore.

"You have your Editor which can go to the Syntax Checker, the Syntax Checker can then go automatically back to the Editor. From the Editor you may then go to the Animator and play around in the Animator and then go to your Build or your Run. But you never have to worry about the operating system anymore. Unless you want to. And that, I found, was the greatest time saver.

"I didn't constantly have to keep going back to some A prompt or C prompt, entering another program, getting the parameter spelled wrong, having to re-enter the file name I just used, all of that. Maybe individually it isn't significant, but if you're working with a program hour after hour, it becomes extremely significant. That, to me, was very high on the list.

"Second is the whole area of the development tools that you offer people. And those are the different parts of the Professional COBOL system. The Editor, Syntax Checker, Forms, Animator, the Library function, the Build function, and more. In detail, being able to create a help screen just by calling help, being able to change the attributes on the screen by the call for the screen attribute, all of that is very significant. And although in every other COBOL there was a way of doing it, it was very hard. In those systems, it was something you were almost better off not getting involved with.

"The next most significant thing I found was your Forms generator. I looked at several other COBOLs that didn't have any Forms generator at all. Although you can do most of the things you can do through Forms, a conservative estimate is that it takes 10 to 15 times longer doing it that way as compared to using the Forms product. Those which do have some type of Forms equivalent are either very primitive or don't provide color support.

"People who are developing COBOL code for microcomputer use, have to be very conscious of having very nice, easy-to-use screens. It is very hard to generate nice easy screens in a timely fashion on a line by line basis, so Forms has it all over the other packages in that regard.

"However, there are many times when you just want to place the cursor in a certain position or you only want to accept something from a certain part of the screen. You also provide those facilities through your subroutine calls. I can either use the Forms generator, or I have enough control through the calls to move the cursor where I want and set the attributes on or off where I want to. That covers it both ways. Where many of the products didn't cover it in the Forms generation way, you handle it on both sides. And it's absolutely critical: If I'm generating applications to be used on the micro, then odds are the screen handling becomes critical.

"Also important, is the Editor. It is a very friendly editor and far and away the best editor I've seen. When I hit the carriage return in your editor and I'm working in column 12, it assumes I want to go to column 12 again. All the other editors I worked with assumed I wanted to go to either column 1 (which isn't very useful in COBOL) or column 8, so I would constantly have to use the arrow keys or space keys to get to where I wanted to go. That's a small example but it is indicative of the thought that went into building your editor.

"The next thing is the Animator. Again, many of the products don't have Animators. For the one that comes closest to matching yours, if I were to list feature by feature what yours can do and what theirs can do, they may seem the same, but from actual usage it is much easier to use the Micro Focus Animator, and there is much greater functionality with it.

"Another nice thing about Animator goes back to my original comment: I'm within the COBOL environment which means I don't have to compile the program prior to getting the Animator running. You work with Animator for a while, you go back into the Editor, you make changes, you go through the Syntax Checker, then you're back in Animator. The other products that had some type of interactive debugger always required you to go all the way through the compiling step, which takes a long time. And since none of the other COBOLs had any serious syntax checker, one typo means going back through the whole process again. From a productivity point of view, I greatly increased my lines of code produced per minute by having Animator built within the COBOL environment."

Verbatim transcript from an independent consultant programmer sharing his feelings after conducting an in-depth survey of alternatives for COBOL development on the PC.

Act Now

To order Professional COBOL, call Micro Focus at 415/856-4161.

MICRO FOCUS

SOFTWARE & SERVICES

AIDS from page 50**OXFORD SOFTWARE CORP.**
Maxilink

Oxford Software Corp. has announced a facility for its Maxicalc II that reportedly allows IBM CICS mainframes and IBM Personal Computers to share spreadsheet data.

According to a company spokesman, Maxilink lets users move worksheet data between Maxicalc II data sets and a library file. Maxilink uses Oxford's Pcmmainframe micro-to-mainframe data transfer package.

Maxilink is free to Maxicalc II users. Maxicalc II is priced at \$9,000 for IBM's DOS operating system and \$12,000 for the OS operating system. Pcmmainframe for the IBM Personal Computer, Personal Computer XT and compatibles is \$9,000 for the DOS license and \$12,000 for the OS version. Prices for Pcmmainframe include the cost of eight Personal Computer licenses.

Oxford Software, 174 Boulevard, Hasbrouck Heights, N.J. 07604.

PRODUCTIVITY AIDS**MULTIPLICATIONS SOFTWARE, INC.****Accolade 3.1.5**

Multiplications Software, Inc. has announced Version 3.1.5 of its Accolade application development system for IBM mainframes under IBM's

DOS/VSE, DOS/MVT, OS/MVS and OS/VS1 operating systems in the IBM CICS environment.

According to a spokesman, enhancements to Accolade include a full screen editor, extensions to its data base access support, field mode map support, the ability to transfer control between Accolade and non-Accolade transactions, extended terminal definition support and a user exit within the product's data base access routines.

Perpetual license fees for Version 3.1.5 of Accolade are \$28,000 and \$39,000 for the DOS and OS environments, respectively.

Multiplications Software, 1050 Massachusetts Ave., Cambridge, Mass. 02138.

DATA RELATIONSHIPS SOFTWARE, INC.**Enhancements to Draft**

Data Relationships Software, Inc. has announced an enhanced version of its Draft productivity aid for users of IBM's Data Dictionary on mainframes under IBM's MVS operating system.

According to a spokesman, Draft — a keyword-driven program generator that exhibits the characteristics of a compiler language — uses IBM's Program Access Facility as a lower level access method imbedded within a concept-oriented interface to the Data Dictionary.

Enhancements to Draft include full IBM MVS/XA support, single commands to access standard categories and related information, sort

command simplification, a capitalization routine to allow for conversion to mixed case when printing, user-defined headings, an additional sort field for the system's matrix routine, sorting of internal tables and additions to the library of programs.

Draft can be leased at \$315 per month and purchased for \$13,500.

Data Relationships Software, Suite 600, 1000 RIDC Plaza, Pittsburgh, Pa. 15238.

HAMILTON INNOVATION & TECHNOLOGY CORP.**Micro-Master**

Hamilton Innovation & Technology Corp. has announced a software package that can be used to develop data base and records management applications on Digital Equipment Corp. processors.

According to a spokesman, Hamilton's Micro-Master combines data dictionary, windowing and artificial intelligence techniques to eliminate the need for programming. File, form and report layouts are defined by drawing a picture of the desired product on a computer screen or terminal. Calculations, branching between forms and logical control are defined interactively using the vendor's natural language processor.

The product can be used with DEC's PDP-11, Micro-11, VAX and PC 350 systems utilizing DEC operating systems and AT&T's Unix. Prices range from \$1,000 to \$20,000.

Hamilton Innovation & Technology, Suite 710, 60 Bloor St. W., Toronto, Ont., Canada.

APPLICATION PACKAGES**SYSTEMS ASSOCIATES, INC.**
Proc-Secure; MSL

Systems Associates, Inc. has announced a version of its Proc-Secure security system for IBM System/34 and 36 minicomputers running under IBM's SSP operating system.

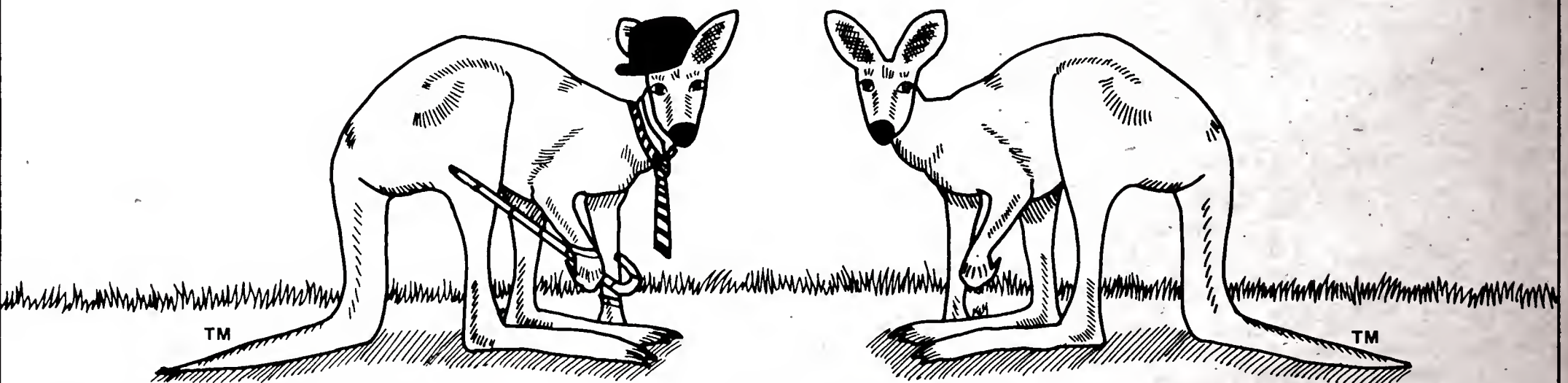
According to a spokesman, the menu-driven Proc-Secure (\$150) provides security "block out" at the procedure level. The SSP version contains security listings by procedure and user identification. Uses of the product include placing security on system procedures to restrict their use; placing security on library procedures, allowing modification of libraries but restricting the copying or removing of members; limiting sensitive user procedures to key personnel; and securing periodical procedures.

Systems Associates has also introduced a multiple-stock-location inventory system for IBM's Manufacturing, Accounting and Production Information Control System (Mapics) users on System/34 and 36 under SSP. MSL (\$1,295) — used in conjunction with Mapics' Inventory Management module — allows the user to take advantage of Mapics features, such as manufacturing and purchase-order tracking, while maintaining inventory items in multiple locations, the company said.

Systems Associates, P.O. Box 64, Caledonia, N.Y. 14423.

See us at Interface in March, Booth 2510.

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- Gives non-SNA devices SNA equality through NPDA support, dynamic reconfiguration capability.
- Concurrently maps multiple protocols to multiple LU types for most ASCII, BSC and Burroughs devices.
- User macros for personalizing non-SNA devices.
- Versatile host program for downloading configurations.



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COMMUNICATIONS

DG expands product line

Announces processor board, protocol support, intelligent local net controller, remarketing deal

By John Dix
CW Staff

WESTBORO, Mass. — In a spate of communications product announcements, Data General Corp. introduced a communications processor board that can be used to replace three older boards; an intelligent local network controller; support of two de facto standard, high-level local net protocols; a remarketing deal with Ungermann-Bass, Inc.; and a statement of direction regarding the manufacturing network promulgated by General Motors Corp.

The communications processor and local network controller are both board-level products for DG's Eclipse MV series of 32-bit superminicomputers.

Dubbed the MCP1, the communications processor combines the functions of three separate boards — an asynchronous driver, synchronous driver and parallel line printer controller — on a single circuit board.

This combination decreases costs, lowers power requirements and foreshortens the need to add expansion cabinets, according to Joe Forgione, communications products manager for DG's Information

Systems Division.

Previously announced as part of the MV/4000 SC, a low-end, eight-user system, the MCP1 is now available for use with the MV/4000, MV/8000 II and MV/10000. The board, which contains 256K bytes of random-access memory (RAM), supports the following:

- Eight asynchronous ports: six with RS-422 interfaces for direct connection of terminals with twisted-pair wire and two that are selectable between RS-422 and RS-232.

- Two synchronous ports that can run at speeds up to 56K bit/sec and support X.25 and IBM bisynchronous and Synchronous Data Link Control protocols in conjunction with the respective host software, DG/Binary Synchronous Communication, DG/X.25 and DG/System Network Architecture.

- A parallel line printer controller.

Forgione said the combination of capabilities will enable departmental clusters — with terminals, printer and link to other resources — to be supported from this single board. Available now, the MCP1

See DG page 58



DATA STREAM

John Dix
CW Senior Editor

Wang switch purchase hints at service use

Wang Laboratories, Inc. recently agreed to purchase from AT&T a large communications switch that is normally sold only to telephone companies. Considering the capacity of the switch and the other switching equipment the minicomputer manufacturer possesses already, it appears that the new switch will play a role in a forthcoming Wang communications service.

Although many details of the switch sale were not disclosed, including particulars about the device and the value of

the contract, AT&T acknowledged that Wang is the first non-carrier to purchase a 5 Electronic Switching System (ESS).

The 5 ESS, AT&T's fifth-generation electronic central office switch, is known as a Class 5 local switch. These switches are normally used by local telephone companies to provide basic telephone services and Centrex services, which give business users capabilities similar to private branch exchanges (PBX).

A modular switch, the 5 ESS can support as few as 3,000 to 4,000 subscriber lines and as many as 50,000, according to Jerry Johnson, manager of digital switching product management for AT&T Network Systems. He noted, however, that the economics of the 5 ESS are such that AT&T would not start bidding the switch for private networks under 8,000 to 10,000 lines.

At that size, the 5 ESS overlaps the System 85, AT&T's high-end PBX. With the upgrade announced last November, the System 85 can support up to 30,000

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■ Datagraf, Inc. has announced its Series II Burroughs Poll Select protocol converters for Burroughs Corp. environments/58

■ Renex Corp. has announced a reverse protocol converter that allows IBM 3270-type display stations to emulate Ascii terminals/58

■ SST, Inc. has adapted two of its software packages for AT&T 3B computers/60

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AT&T details private-line rates

End-to-end prices to rise, general prices to fall

WASHINGTON, D.C. — On the heels of a Federal Communications Commission decision to delay implementation of special-access charges proposed by local telephone operating companies, AT&T Communications released a statement outlining how the tariffs would affect its private-line rates.

While the company anticipates per-mile private-line prices to decline, it expects overall prices for end-to-end service to increase. AT&T said the rate increases are the result of incorporating higher special-access charges levied on it by local exchange carriers. "The tariff revisions would allow AT&T to pass along to cus-

tomers the costs of obtaining local access," the company reported.

In the filing, AT&T did not specify new rates but asked the FCC to allow three new tariffs to be put into effect Feb. 15, the same day the local carriers are expected to be allowed to begin charging the higher special-access rates.

In the filing, the long-distance carrier asked the FCC to waive the 45-day period for considering new tariffs and reported that it would file actual tariffs after the FCC's decision.

The company said the three new tariffs would replace six current ones and give customers more configuration options.

Hardware vendor influence seen boon to videotex systems

Although there are little more than 100 private videotex systems installed today, the active involvement of major computer manufacturers and the new emphasis on integrated systems will encourage further use of videotex, according to Link Resources Corp., a market research company in New York.

In its report, "Private Videotex Systems Survey: 1984," Link defines private videotex systems as machines designed for in-house use by companies and institutions or between one of these types of establishments and a distributor or supplier with which they do business. Broadly defined, videotex systems make conventional computer systems easier to use by nontechnical personnel.

A major development in videotex in 1984, according to Link, was the market entrance of major computer hardware manufacturers. Digital Equipment Corp. is reportedly the first manufacturer to offer a videotex software product in North Ameri-

ca and is thought to have 30 orders already for the product.

Other companies eyeing the videotex market include IBM, which Link believes is developing videotex software for its mainframe machines, and Honeywell, Inc. Sperry Corp. introduced videotex software late in 1983. Historically, vendors of private videotex systems have been software houses that created stand-alone systems by bundling their software with off-the-shelf hardware.

The market entrance of the computer manufacturers gave rise to another perceptible videotex trend in 1984: an emphasis on integrated videotex systems. Integrated videotex systems are created when users procure software to run on existing processors, enabling users of existing workstations and terminals to access the system.

"The best example of the integrated software approach," Link reported, "is [DEC's] VTX, which runs on any VAX minicomputer, can be accessed

by any VT100 or VT100-compatible terminal and can use the Decnet network architecture."

The emergence of integrated systems marketed by computer manufacturers is also influencing the standardization of the presentation protocols. Although Ascii is still not widely used, it is becoming more popular as the computer manufacturers get involved, Link said.

For all of that, broad commercial acceptance of videotex is still a ways off. By Link estimates, 105 private videotex systems are installed to date: 85 stand-alone and 20 integrated systems, reflecting how relatively new the latter is. By 1986, a total of 530 systems will be installed, Link forecast: 355 stand-alone and 175 integrated systems. And by 1989, 3,175 systems will be installed: 1,730 stand-alone and 1,445 integrated systems.

More information about the report is available from Link, 215 Park Ave. S., New York, N.Y. 10003.

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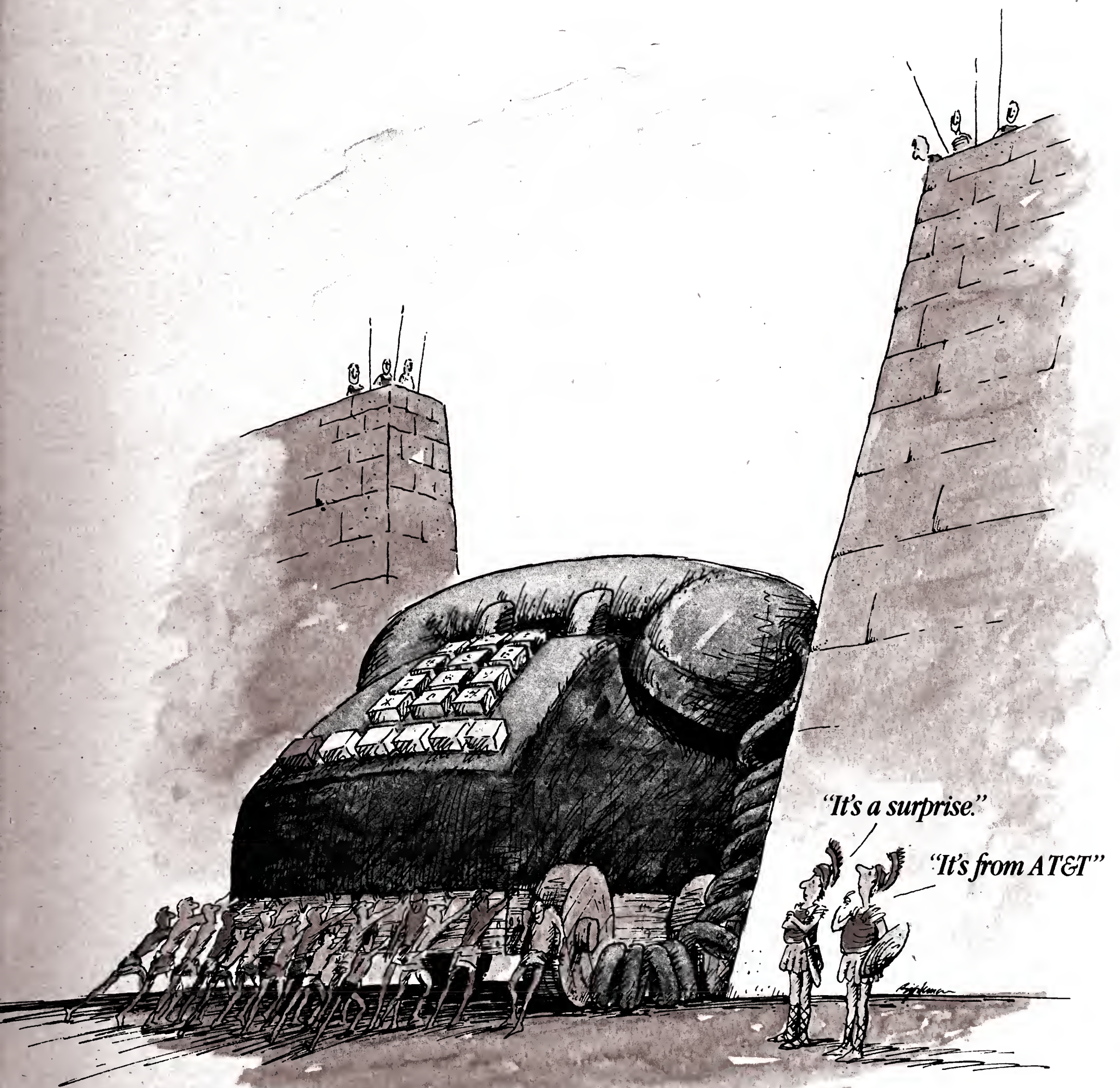
There's a reason: The sooner AT&T can sell all that decade-old technology to someone, anyone, the happier it will be.

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yesterday's communications systems, you'll be happy, too.

But if you'd like a phone system that can talk to a mainframe, dig out a business article, take a message, forward it, find the cheapest long distance route and tell you which phone was used to call whom for how long and how much, talk to ROLM.

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COMMUNICATIONS

PROTOCOL CONVERTERS

DATAGRAF, INC. Series II BPS

Datagraf, Inc. has announced its Series II Burroughs Poll Select (BPS) protocol converter, available in two versions to give Burroughs Corp. terminal features to other manufacturers' terminals and to let Burroughs terminals communicate with a non-Burroughs host mainframe.

The first version is said to permit Digital Equipment Corp. VT100 and VT220 and Wyse Technology, Inc. Wyse 75 terminals to perform full screen editing, supporting all Burroughs TD-830 features while communicating with a Burroughs host mainframe. The mainframe may be

local or remote and linked via an RS-232C interface.

The second version is said to allow Burroughs Voltage Loop terminals and asynchronous or synchronous terminals to communicate with a non-Burroughs host in an IBM Systems Network Architecture/Synchronous Data Link Control environment.

It costs \$5,600.

Datagraf, 6626 Silvermine Drive, Austin, Texas 78736.

KMW SYSTEMS CORP. Series II+ 3287 Coax Protocol Converter

KMW Systems Corp. has announced its Series II+ 3287 Coax Protocol Converter, which is said to allow local attachment of non-IBM output devices to IBM 3270 cluster controllers.

The product reportedly enables an Ascii printer to emulate the functionality of an IBM 3287 Model 1 or Model 2 printer. It was designed to accept IBM Systems Network Architecture (SNA) Logical Unit Type 1, SNA Logical Unit Type 3 or IBM bisynchronous data streams, depending upon the application and local controller.

It costs \$1,995.

KMW Systems, 8307 Highway 71 W., Austin, Texas 78735.

RENEX CORP. Bi-Path

Renex Corp. has announced Bi-Path, a product that the company said acts as a reverse protocol converter, allowing IBM 3270-type display stations to emulate Ascii terminals.

Bi-Path reportedly provides the

means for IBM 3278 and look-alike display stations to access various minicomputers and mainframes, public data bases, service bureaus, packet-switching networks, electronic mail systems and microcomputers.

An independent unit, Bi-Path was designed for use with IBM 4300 and IBM 3080 series and compatible control units. It is said to operate with IBM Systems Network Architecture, bisynchronous, local channel and other protocols that support IBM 3278 and compatible display stations.

It enables those terminals to emulate Digital Equipment Corp. VT100 or IBM 3101 terminals and will support most serial printers, according to the vendor.

It costs \$699.

Renex, 6901 Old Keene Mill Road, Springfield, Va. 22150.



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MULTIPLICATIONS *

UCCEL has selected Imagine for use with its application software products. Multiplications has offices in the following locations: Cambridge, MA. Atlanta, GA. New York, NY. Oakland, CA. Rochester, NY. Toronto, CN.

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DG from page 55

costs \$5,000.

The board-level Intelligent Local Network Controller enables processors in the DG MV product line to connect to IEEE 802.3, Ethernet-like baseband local-area networks. The controller board is microprocessor based, has 256K bytes of RAM and can be programmed by the user, Forgione said.

The board's intelligence, combined with direct memory access, reportedly enables file transfers to be accomplished with a single CPU interrupt. This is said to provide for higher data throughput because the microprocessor off-loads the CPU by executing all file transfer instructions, Forgione explained. The controller is now available for \$4,500.

In recognition of different industry local network needs, DG introduced support of the U.S. Department of Defense's Transmission Control Protocol/Internet Protocol (TCP/IP) and Xerox's Xerox Network Systems (XNS) high-level local network protocols. Both products complement Ethernet-type local networks with higher level protocols to the applications level.

DG claims to be the first vendor to support TCP/IP under native Unix and a proprietary operating system, the company's AOS/VS. This reportedly enables DG's Eclipse MV processors and distributed system workstations running either operating system to coexist on the same local net.

Forgione said TCP/IP is aimed at technical, federal and academic systems, whereas XNS is more broadly used in the commercial marketplace. XNS will be supported only under AOS/VS.

The initial license of TCP/IP costs \$2,000 and subsequent licenses are \$1,550. XNS costs are the same, and both are now available.

In a joint marketing deal with Ungermann-Bass, DG will market the local net manufacturer's Net/One Ethernet-compatible broadband network, as well as Ungermann-Bass' IEEE 802.3 repeater to interconnect multiple Ethernets. Prices and information are available from Ungermann-Bass.

Finally, in a statement of direction, DG pledged its support to future compatibility with GM's Manufacturing Automation Protocol, a specification the automaker is pushing as a standard for factory automation local networks.

In the overnight air express business, it's axiomatic: It's people, not planes that deliver. So improving worker efficiency is critical. That's why Burlington Northern Air Freight uses Davox integrated workstations. In customer service, for example, they found Davox systems help people work about "twice as fast" as the previous system.

The reason: Davox voice/data integrated workstations feature 16 "Smart Buttons" that can access data or perform multiple commands with a single keystroke. In the case of Burlington Northern Air Freight, that meant almost double the productivity.

In addition, Davox is both 3270 (SNA/SDLC or BSC) *and* Async so it's totally flexible, able to work in any IBM or IBM-compatible main-frame environment.

DavoxNet—our networking design that transmits voice and data simultaneously over existing twisted pair telephone lines—eliminates expensive coaxial wiring, as well. And, as a Value-Added Dealer for the IBM PC, Davox offers PC resource sharing throughout a network.

Today Davox systems are at work in Fortune 1000 companies in a broad variety of applications, from securities trading to telemarketing

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For complete information, call John Flint, Marketing Manager at (617) 667-4455 or toll-free at 1-800-343-1152. Or write him at Davox, 4 Federal Street, Billerica, MA 01821.

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COMMUNICATIONS

SOFTWARE

SST, INC.
Handshake

SST, Inc. has adapted its asynchronous software

package, Handshake, for AT&T 3B2 computers and its Handshake II package for communications between AT&T 3B systems and IBM mainframes. The packages were previously available for Fortune Systems, Inc. 32:16

microcomputers.

Handshake reportedly allows the 3B2 to communicate with other microcomputers, minicomputers and mainframes via cabling or dial-up connections.

Handshake II is said to let 3B computers communicate with IBM mainframes using IBM bisynchronous or Systems Network Architecture/Synchronous Data Link Control protocols via standard cabling or telephones.

Handshake costs \$350, and Handshake II costs \$1,795.

SST, 9434 N. 107th St., Milwaukee, Wis. 53224.

MULTIPLEXERS/
MODEMSASTROCOM CORP.
SH192A modem

Astrocom Corp. has introduced a short-haul modem for transmitting asynchronous data at speeds up to 19.2K bit/sec over distances up to 1 3/4 miles over standard twisted-pair transmission

lines.

The SH192A modem features digital and analog loop-back and a status indicator panel. It functions in either point-to-point or multipoint network configurations. The unit is available in stand-alone, rack mount or circuit card versions.

The SH192A stand-alone version is priced at \$295 per unit, while the circuit card model is \$195.

Astrocom, 120 W. Plato Blvd., St. Paul, Minn. 55107.

MICOM SYSTEMS, INC.
M6212+ Automatic Outdial Modem

Micom Systems, Inc. has announced its M6212+ Automatic Outdial Modem for remote computer access from terminals on a Micom Micro 600 Instantnet data switch.

The modem is said to let users request remote systems by name without knowing the telephone number or location of the computer. It reportedly communicates with AT&T 212A-compatible modems at 1,200 bit/sec and with AT&T 103-type modems at up to 300 bit/sec.

The M6212+ is a single-card module that fits into a rack mount chassis, with up to 16 modems per chassis.

A single M6212+ costs

\$645. The chassis with integral power supply for up to 16 modems costs \$750.

Micom Systems, 4100 Los Angeles Ave., Simi Valley, Calif. 93063.

LOCAL-AREA
NETWORKSKEE, INC.
3278 enhancement

Kee, Inc. has introduced an enhancement providing its Kee LAN local-area network with IBM 3278 terminal support.

The enhancement, which involves replacing a board in the Kee LAN product, is said to allow Coax A 3274 and 3278 connections in addition to support for asynchronous protocols.

It reportedly allows IBM 3274 Cluster Controllers to communicate with IBM 3278-type terminals via a local-area network and is said to let IBM 3278-type terminals communicate with non-IBM hosts.

A two-port unit with 3278 support costs \$2,995, and in quantities of 100, it costs \$2,295, according to the vendor.

Kee, 10739 Tucker St., Beltsville, Md. 20705.

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lines. The decision of going with one switch over the other would depend on the type of installation — high-rise or campus environment — desired voice- and data-handling features and need for expandability.

The System 85 currently has a richer set of user features than the 5 ESS, Johnson admits, but the 5 ESS can support many more users. In fact, later this year, a second issue of software will be released for the 5 ESS, which when combined with a new piece of hardware for the communications module of the network switch, will enable the 5 ESS to support up to 100,000 lines.

What would Wang want with a 5 ESS? The canned claim is that the switch will be used to meet internal voice and data needs. Consider, however, that the company has roughly 15,000 employees in the Merrimack Valley, which includes the town of Lowell, Mass., where the company is based. While Wang could use a 5 ESS to support all of these employees, that is not likely because it recently purchased a 10,000-line PBX from Intecom, Inc., a switch manufacturer of which Wang owns 21%. The Intecom IBX S/80 will reportedly serve the towers that are part of the company's headquarters.

This would seem to indicate the 5 ESS is destined for another application. Although typically employed today as a local switch, the 5 ESS is used in a few installations as a Class 4 or toll switch. It is possible that Wang will use the 5 ESS, which is expected to be delivered later this year, in a toll application, perhaps as a hub for multiple digital T1 1.54M bit/sec communications facilities.

In this scenario, Wang could use such a T1 network for intracompany voice and high-speed data applications, including communication of computer-aided design and manufacturing data. Additionally, the high-speed data capabilities would potentially enable Wang to offer its customers access to special software development facilities and tools, similar to the way IBM uses its Information Network.

Capable of packet switching, the 5 ESS could also be used in Wang's Wangpac, a 50-city packet-switched network built for Wang and presently operated by Bolt Beranek and Newman, Inc. of Cambridge, Mass. This network, which is supposed to interconnect 120 cities when completed by the end of the year, is already used to support 700 Wang computer systems.

Regardless of implementation, it is clear that Wang, like other office system vendors, intends to offer communications services that complement its products. The 5 ESS will probably play a key role in providing such services.

IN DEPTH

Good fits, bad fits and misfits

Making document interchange work

MIS managers can wait for that perfect world where all systems will sing from the same song sheet (three to five years away), or they can respond today to user needs for connectivity by installing some form of document interchange technology.

By Michael Zisman

While we take for granted the ability to interconnect phone and postal systems, we are just beginning to understand the emerging requirement to interconnect office systems. Today, one expects to pick up a telephone and call anywhere in the world without being concerned about what type of equipment the other party has or what type of networks must be traversed to get to the other party. Likewise, a major requirement for interconnecting office systems will be the ability for one user to send a message or document to another party without concern for the type of equipment or network.

The office systems landscape is complex, ranging from mainframe-based office automation systems to personal computers; consequently, the interconnection requirements are diverse. When considering document interchange technology, the right question is not "why," but "why not."

In a perfect world, all office systems vendors would be standardized on a single document architecture, and documents could be distributed freely among systems from different vendors. Someday this will be the case. However, as we have seen in the past 10 years as vendors have tackled the problem of IBM Systems Network Architecture (SNA) compatibility, we are always charging at a moving target.

Even with respect to IBM's very new office architectures, the situation changed significantly in just the past year. What was Level 3 Document Content Architecture is now Revisable Format Text Document Content Architecture. What was Document Interchange Architecture (DIA) has been relegated to Level 0 DIA and augmented with Level 1 DIA. Function Set 1 of DIA has gone away and been replaced with the SNA Distribution Services (Snads) architecture for interconnecting office systems nodes.

Besides chasing after IBM's evolving architectures, vendors are also confronted with standard-setting efforts by the U.S. Navy (the Document Interchange Format [DIF] standard), the Consultative Committee on International Telephone and Telegraph (X.400) and the National Bureau of Standards.

Wait or respond now

MIS managers are confronted with a common dilemma. They can wait for that perfect world when all systems will sing from the same song sheet (probably three to five years), or they can respond to user requirements for connectivity today by installing some form of document interchange technology. Document interchange systems overcome the standardization problem by providing for protocol translation between the different vendors' document structures and

Even if a company can control its own environment, multivendor problems will emerge from intercompany communications.

Some document interchange systems operate point to point, others in a store-and-forward manner much like electronic mail.

Over time we can expect to see document interchange systems on small departmental machines or as local-area network application servers.



IN DEPTH/DOCUMENT INTERCHANGE

interfacing to the various vendors' systems for actual transport of documents among users.

One way to avoid this dilemma is to operate in a single-vendor environment. In point of fact, the trend appears to be heading away from this direction and toward endorsing a controlled number of vendors to meet an organization's needs. This trend is likely to continue for a number of reasons, including the following:

1. As the cost of systems continues to plummet and personal computers become the typical office system workstation, it will become increasingly difficult to control what the end user purchases. Even if standardization occurs at the hardware level, software options will proliferate.

2. Small vendors, particularly word processing vendors, will survive by migrating from general-purpose systems to application niches. Hence, different functional areas in organizations will ultimately look to different vendors for optimal application-oriented solutions.

3. Vendors will continue to rise and fall in capability, and users will respond by migrating to different preferred vendors.

4. A requirement for interorganizational electronic document transfer is emerging. Even if an organization can control its own environment, multivendor issues will emerge for interorganizational communications.

Many companies have already begun to exploit document interchange technology as part of their office automation strategies. Some applications include the following:

- An organization uses a mainframe-based document interchange system to allow professionals who have drafted documents on personal computers to send these documents to their Wang Laboratories, Inc. word processing center in fully editable form for subsequent editing and printing.

- A large corporation implemented a document interchange service to allow documents from Wang, IBM, NBI, Inc. and Xerox Corp. word processors to be interchanged and interfaced to their IBM Professional Office Systems mail network.

- A large agency equipped field agents with portable personal computers and a popular word processing package. These agents prepare reports in the field and transmit them via a public data network to their Wang word processing center for final editing and distribution.

- A company uses a document interchange system to transmit documents from stand-alone word processors to its mainframe in document composition facility (DCF) format. On the mainframe, the DCF documents are integrated with a graphics package.

- A large corporation is using a document interchange system to provide a bridge between numerous Wang systems and an IBM Distributed Office Systems network of IBM 5520s and Displaywriters.

There are numerous applications for document interchange systems technology to integrate disparate office systems environments. Like any other technology, there is no panacea. The better users understand the opportunities and potential problems, the better prepared they will be to make good decisions.

There are two significant dimensions to the use of document interchange technology: intrasite vs. intersite usage and intraorganizational vs. interorganizational usage. There are three distinct market segments: intraorganizational, intrasite usage; intraorganizational, intersite usage; and interorganizational, intersite usage.

Generally, users begin with intrasite, intraorganizational usage to gain familiarity with document interchange technology. They then mature to intraorganizational, intersite usage and, finally, look toward adding interorganizational usage. It is important to note that for interorganizational interchange to become a widespread reality, value-added network service offerings will play a major role, just as the U.S. Postal Service and private courier services

play a major role in facilitating interorganizational paper communications. Almost all organizations are focusing their energies on intraorganizational document interchange. Interorganizational requirements will probably be more prevalent in the 1986-to-1988 time frame.

Product classes

A document interchange system must perform two essential tasks: the document must be distributed from the sender to the recipient, and the document must be translated from the source document structure to the target structure. Broadly defined, there are five classes of systems.

Disk converters. This class of product consists of a hardware device with two or more disk drives. A document from one vendor's disk is

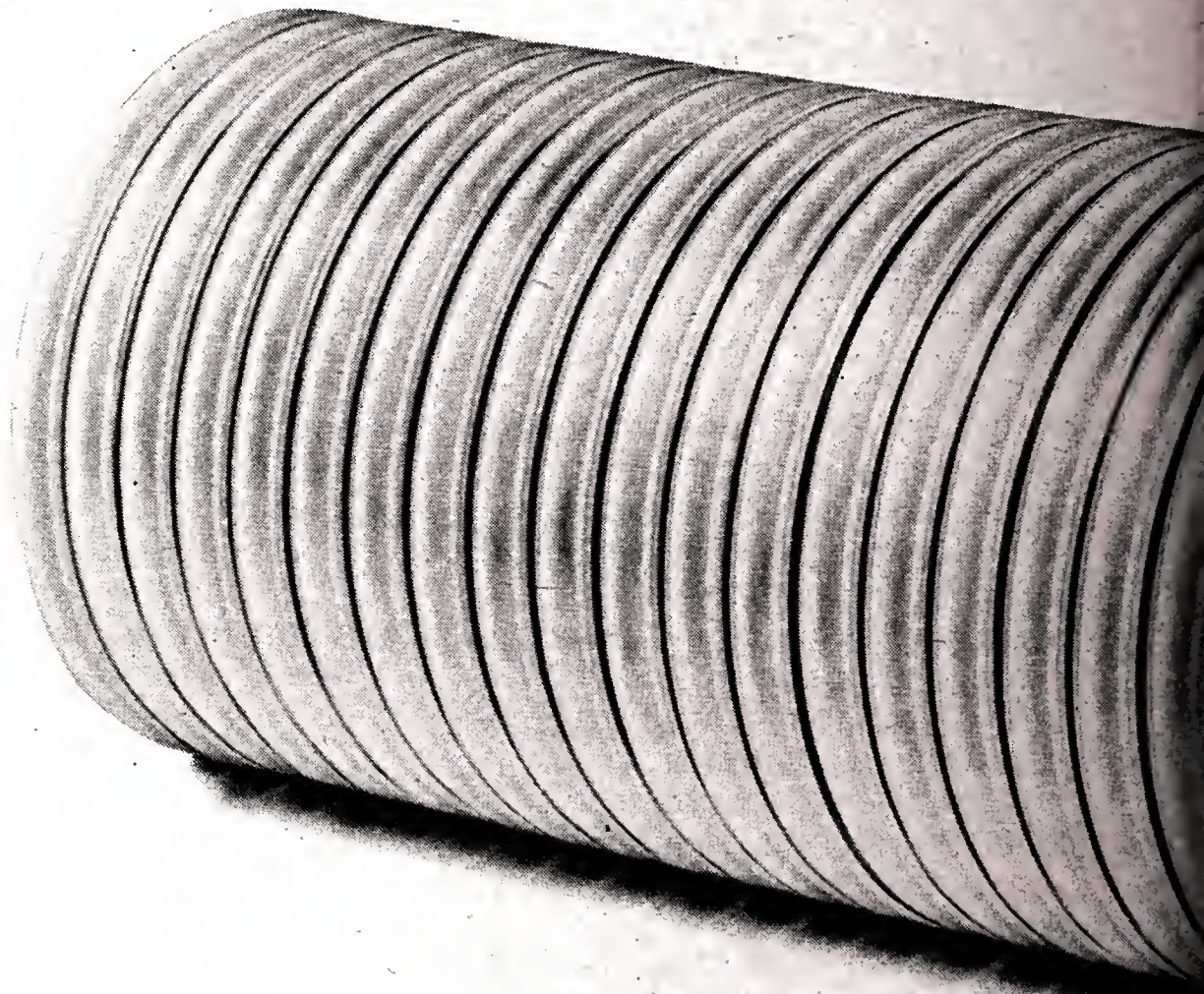
copied onto another disk in the target vendor's format. These systems handle not only the different media formats (disk size, track encoding and so on), but they also convert all of the document coding so that the document is fully revisable on the target system. These systems are useful for conversion and for addressing the needs of the intraorganizational, intrasite market segment. Keyword 7000 from Keyword Systems, Inc. is an example of such a system.

Communicating black boxes.

This class is similar to the disk converters except that the input and output are communications lines instead of disks. These devices are interconnected between the communicating word processors.

Each word processor is configured to communicate to another of its own

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Most computer tapes are a pain.

Because they're abrasive.

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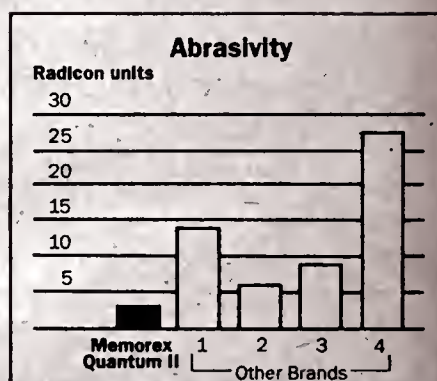
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That coating edge also makes possible the highest output at high recording densities. So your data is safe, even in extreme situations.



Radicon Test measurements above are obtained by running different computer tapes over an irradiated tape drive head. The higher the count of irradiated particles rubbed onto the tape, the more abrasive the tape.

IN DEPTH/DOCUMENT INTERCHANGE

kind; the black box in the middle acts as a similar word processor to each of the two connected word processors. The black box handles all communications necessary to maintain the links and translates the data to the format required on the other side.

Because the translation must be done in real time (that is, as a document is passing through the box), maintaining high translation fidelity can be very challenging. Furthermore, the logistics of establishing the communications sessions with the black box can be awkward. The Rascal-Telesystems, Inc. Model 404 protocol converter is an example of such a system.

IBM host-based document interchange systems. Because IBM plays such a large role in most big organizations, it is natural to host docu-

ment interchange on the customer's IBM mainframe systems. Products in this class exhibit some or all of the following attributes:

- Distribution services provides a comprehensive directory so that users of the system need only send documents to the intended recipients and not be concerned with what type of equipment the recipient has. The required information is found in a user directory. When an incompatibility exists, the system transforms

the document before forwarding it.

- Library services provides the facility to store documents in host-based libraries and index them for searching and subsequent retrieval. When a document is retrieved to a device type different from that which stored it, the document is automatically transformed before forwarding.

- Translation services are obviously necessary to actually perform the document transformations. As

indicated above, translation services are invoked when needed by distribution services and library services.

These systems often interface directly to OA vendors' mail and document distribution systems. Interfaces to Disoss and Profs, Wang's Mailway and Digital Equipment Corp.'s Decmail are examples. For instance, a Mailway user could access Mailway and send a document to another user with no concern at all that the recipient is actually a Disoss user. The Mailway document is first routed to the host-based document interchange system (which is emulating a Mailway node) by Mailway, transformed to IBM format and then passed to Disoss. This attribute will be increasingly important over time.

These systems operate in a store-and-forward mode. A document is sent from user A to user B. The document is first delivered to the host software. There it is transformed into the format required for user B and then forwarded to user B. Because of the store-and-forward nature, translation fidelity can be quite high.

Host-based interchange

Soft-Switch from Soft-Switch, Inc. is an example of a host-based document interchange system. Soft-Switch supports word processors from IBM, Wang, Xerox and NBI. On the IBM Personal Computer, the Multimate word processing program from Multimate International and IBM's Displaywrite II and III programs are supported. On the IBM host, DCF and standard printers are supported.

Through translation services, Soft-Switch can transform the document structure of any of the supported systems to that of any of the other supported systems. Soft-Switch also interfaces directly to IBM's Profs and Disoss products.

Dedicated document interchange systems. Naturally, there is no reason why such functionality should be restricted to an IBM host, and over time we can expect to see document interchange systems on small departmental machines or as local-area network application servers. The emerging generation of high-performance, disk-intensive supermicros will serve as an adequate platform for this technology. Like the IBM host-based systems, the stand-alone systems will provide translation, distribution and library services. Furthermore, they will interconnect other vendors' mail systems and value-added network service offerings.

Value-added network service offerings. Many of the value-added network vendors are targeting document interchange as a major service to exploit their existing network investments. These systems will service a large portion of the interorganizational market segment and will serve as a gateway for an organization's on-premise systems. Vendors currently providing services are General Electric Information Services Co., with its WPXchange product, and MCI Telecommunications Corp. with the document transfer capability in MCI mail. Very important, both of these systems interconnect revisable form interchange systems with final form messaging systems.

These five classes of products will penetrate the three market segments to varying degrees. The projected

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penetration is shown in the figure at right. Disk converters are most appropriate to single-site applications because of the lack of communications. While black boxes provide communications, the lack of store-and-forward capability makes the communication cumbersome. Hence, these devices will be most useful in intrasite applications.

IBM host-based document interchange systems have high penetration in both intraorganizational segments because they exploit the large customer's ubiquitous host-based communications network. The ability of dedicated document interchange systems to gain high penetration in the intrasite segment will depend on the activity of the host-based network.

The value-added network service offerings will play a major role in interorganizational document interchange. As these systems evolve, expect customer's on-premise document interchange systems to interface directly with value-added network service offerings for off-net distribution.

IBM architectures

IBM has traditionally been the de facto standards-setting body in the data processing industry, and that is clearly the case with respect to office systems architectures. IBM has defined and published architectures for document content, document enveloping and the postal system for moving documents through the network.

Document Content Architecture

Market segment	Disk converters	Black boxes	IBM host document interchange system	Dedicated document interchange system	Value-added network service
Intraorganizational/Intrasite	High	High	High	High	Low
Intraorganizational/Intersite	Low	Low	High	Medium	Medium
Interorganizational/Intersite	Low	Low	Low	Low	High

Likely market penetration

(DCA) defines with great precision how documents are to be communicated in both a final form and a revisable form. DCA is a data structure; that is, it is simply a definition of how document coding is specified and how it is to be transmitted.

Document Interchange Architecture (DIA) includes both a data structure definition and a program-to-program communications protocol. DIA defines the protocol with which architected office systems nodes communicate with source and recipient nodes (workstations).

The SNA Distribution Services architecture is the newest member of the IBM office systems architecture.

Snads defines the architecture of a post office and the protocol by which post offices communicate with each other and with users of the post office. At the moment, the only IBM products that implement the Snads architecture are Disoss at the Version 3.2 level and the IBM 5520 administrative system at the Version 3.1 level.

LU 6.2 is the IBM SNA protocol for program-to-program communications. LU 6.2 is the converging protocol for SNA products.

Disoss is a strategic product from IBM and a cornerstone of the IBM office systems architecture and large account marketing strategy. Disoss is

implemented within an IBM CICS transaction processing environment and provides the ability to interconnect all IBM office system products by providing document distribution and document library services capability.

Disoss currently supports interconnection of Displaywriters, IBM 5520 administrative systems, IBM 8100/DOSF systems and the IBM Scanmaster. IBM has announced Personal Services/370, which provides a Disoss interface to a 3270 terminal community, and Personal Services/Personal Computer, which extends Disoss capability to the IBM Personal Computer.

In 1981, IBM made a critically important statement of direction when it indicated that it intended to provide a capability for editable interchange of documents across all IBM office products. With the delivery of Disoss Version 3.2, IBM has essentially completed implementation of the statement of direction. In most cases, any necessary document translation is done at the receiving system.

Profs is the black sheep of the IBM office products family. IBM declares it a "nonarchitected" product, which means it does not use any of the architectures outlined above. Nevertheless, it has been an outstandingly successful product. Profs is essentially an electronic mail system that runs under IBM's VM operating system and supports users of 3270 terminals.

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  <--OSNAME--> VOLSER ALLOC USED EX ORG RECFM BLKSIZE LRECL LASTREF
SPF  A42.CNTL  TSO010   3   2   1   PS  FB   3120   80  08/23/84
B    APROJ.TEXT TSO012   8   8   1   PS  FB   3120   80  07/08/84
FSE  B13.COBOL  TSO008  10   8   1   PS  FB   3120   80  08/13/84
OEL  CP21.TEXT  TSO007   8   8   1   PS  VB   3120  255  08/23/84
REN  OEN.FORT   TSO005   4   3   1   PS  FB  1800   80  09/20/84
COPY EZ.ASM    TSO002   3   3   1   PS  FB   3120   80  10/02/84
SUB  FMOO1.CNTL TSO006   1   1   1   PS  FB   3120   80  04/12/84
PRNT G20.LIST   TSO003  20  16   1   PS  VB   3120  255  09/20/84
COMP HOL.TEXT   TSO008  30  30   3   PO  VB   3120  255  10/15/84
RLSE IMODEL.LOAD TSO010  50  18   1   PO  U     0 19089  08/03/84
LM   JCL1.CNTL  TSO002  20  16   1   PO  FB   3120   80  09/15/84
FREE KA.COBOL   TSO004   6   5   1   PS  FB   3120   80  08/20/84
---- TSO.PL1    TSO003  10   8   1   PS  VB   3120  255  10/23/84
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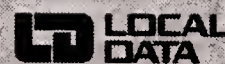
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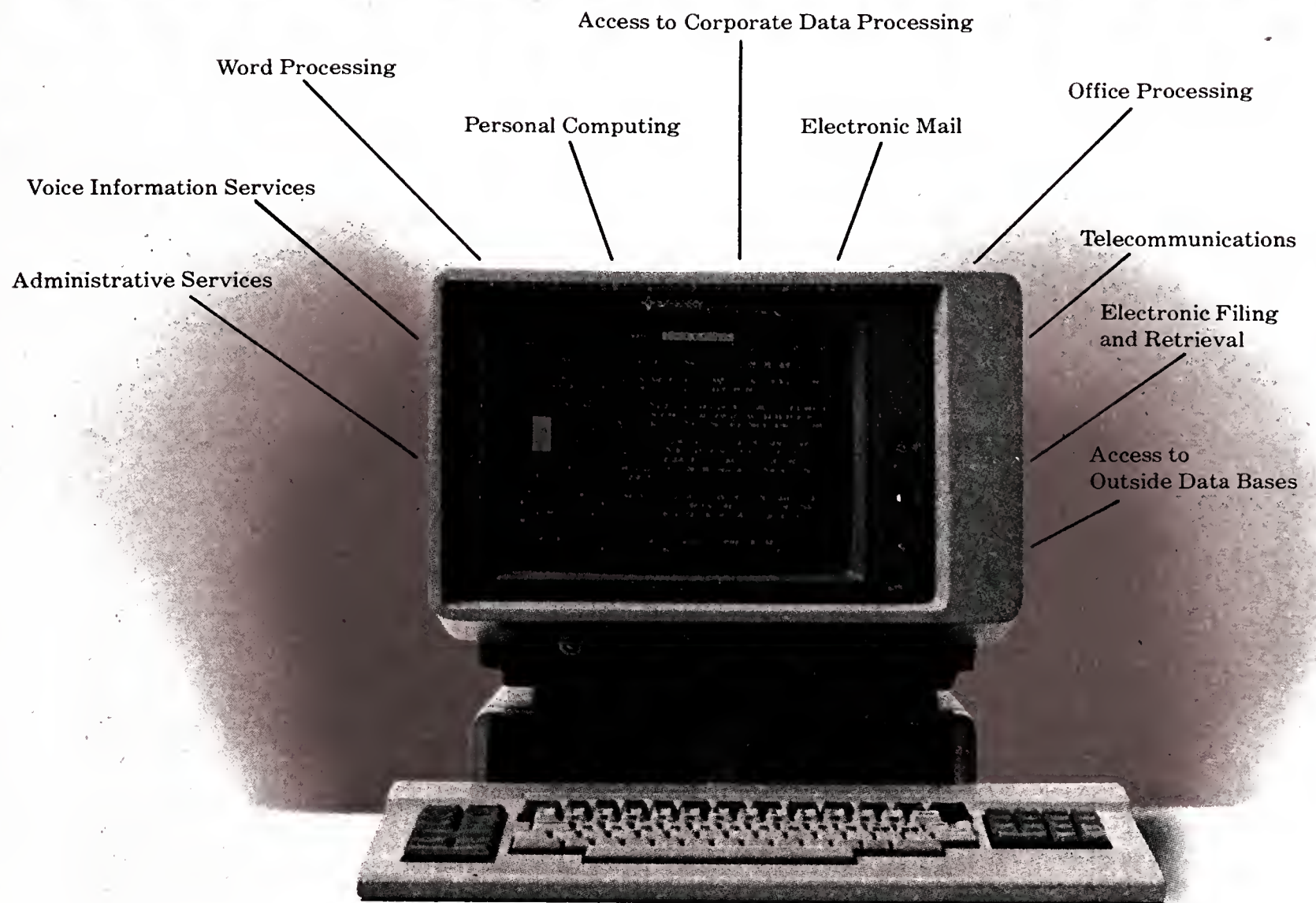
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of office systems products through the use of the above architectures, but there is still much work to be done. DIA, DCA and Snads are quickly becoming de facto standards in the industry. All major office systems vendors have announced the commitment to interface to Disoss and some to Profs.

While there are other standard-setting efforts in progress, it certainly appears that IBM's architectures have gained a tremendous amount of momentum. An alternative to DCA is a recently announced U.S. Navy document standard called Document Interchange Format. While many vendors have announced support of DIF, it is not nearly as comprehensive as DCA. X.400 is a proposed CCITT standard for interconnecting messaging systems that provides a similar level of function as IBM's DIA. It is

likely that the relationship between X.400 and IBM architectures will be similar to the current relationship between X.25 and SNA: peaceful co-existence.

DIS technology

Document interchange systems include hardware and/or software to distribute revisable form documents among equipment from multiple office systems vendors. Some document interchange systems operate point to point, and others operate in a store-and-forward manner and look very much like electronic mail systems. A number of key issues must be considered from the user's perspective:

- How is the document physically transported from the sender to the recipient?

- Does the sender need to know

the type of equipment the receiver has, or does the document interchange system maintain this information?

- How is translation performed, and how accurate is the translation?

- Does the document interchange system interface directly to the user's office systems equipment or to vendor-specific OA mail systems such as Disoss, Profs or Wang Office?

Document interchange systems must provide two types of service to three types of end-user workstations. The two types of service are translation and distribution. Some document interchange systems also include a library service facility. Although this is a desirable feature, it is not a necessary component of a DIS. The three classes of end-user workstations are personal computers

using word processing software, word processing systems and departmental OA systems and mainframe terminals accessing office automation services (for example, Profs and Disoss users).

The basics

Final form vs. revisable form. A document may be sent from user A to user B in either final or revisable form. Final form is essentially print image. This means that the document can be viewed by the recipient and printed, but it is not intended to be modified by the recipient's word processing system. This is because there is no "coding" in the document to indicate format controls such as underline, indent and center.

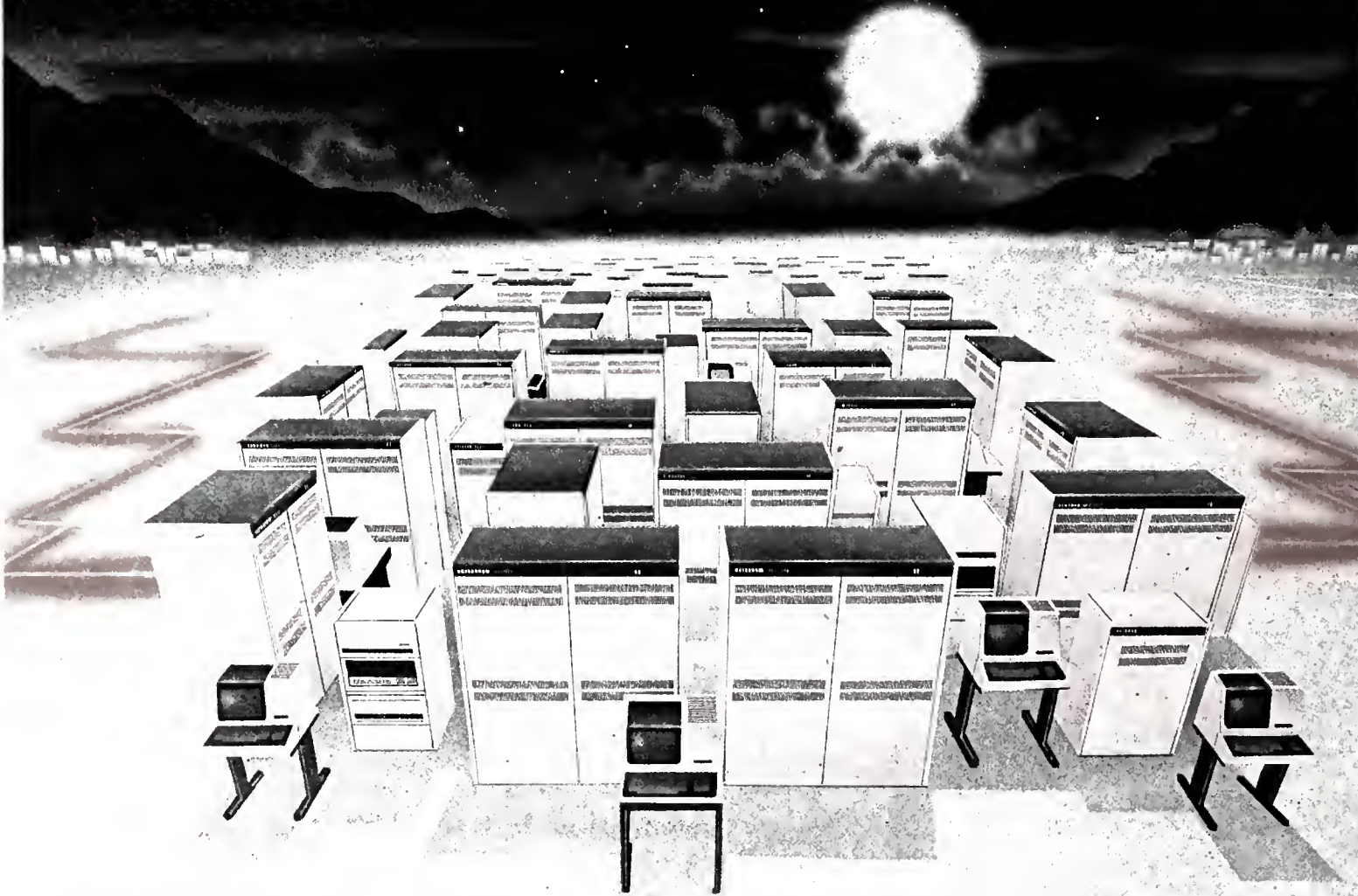
Revisable form, on the other hand, means that a document is to arrive at the recipient's system in a form that is completely editable. All of the coding for format controls must be contained within the document.

The handling of center codes is a good example to highlight the difference between final form and revisable form transmission. Let's assume that a document exists on a Wang word processor and that certain lines are centered. This means that on the Wang word processor there is a one-byte control character at the beginning of each line to indicate centering, followed by the text to be centered, followed by a carriage return.

When the text is displayed or printed on the Wang word processor, each line beginning with a "center" code will appear centered. If the margins of the document were changed, the text would still be centered within the new margins. If this document were to be transmitted in final form, the center code would be replaced by the appropriate number of blanks so that the text would appear centered within the given margins. If this text were transmitted in revisable form, the center code itself would be transmitted instead of the blanks.

Herein lies the problem of multi-vendor document interchange. If we

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OAC makes connections

Michael Zisman will chair a session on document interchange at the Office Automation Conference (OAC). The conference, sponsored by the American Federation of Information Processing Societies, Inc., will be held at the Georgia World Congress Center in Atlanta Feb. 4-6.

Participants in the document interchange session on Feb. 5 will discuss user experiences, vendor perspectives and opportunities with value-added network service offerings.

The annual OAC is geared to office automation implementers and vendors. More information is available from Afips, 1899 Preston White Drive, Reston, Va. 22091.

terchange systems, it is important to note that the lines of distinction are rapidly beginning to blur. Some mail systems provide document interchange capabilities as ancillary services. Examples of this include Geis-co's WPXchange service, which is linked to its Quikcomm electronic mail system, and MCI's Document Exchange Service, which is linked to the MCI mail system. Likewise, some document interchange systems provide links to final form mail systems and provide the ability to transport final form messages.

Protocol levels. Document interchange systems are one of the very few areas where protocol conversion is being performed at the application level. Most types of protocol converters accept bits in one end and put bits out the other end and, in general, have no idea what the informa-

tion content of the bits is. When translating from bisync to Synchronous Data Link Control, one is not at all concerned with whether the actual data in the packets is payroll data, word processing text or anything else. At that level, the only concern is with the data enveloping the applications-level data.

Such is not the case with document interchange. At this level of protocol translation, we are very much concerned with every bit in the data stream.

To translate a document from a Wang to an IBM word processor, we must understand precisely what the format of a Wang document is and what the coding is in that document; likewise, we must have the same level of understanding for the IBM document structure. Last, we must have an ability to transform each

item of Wang coding to IBM coding.

Canonical form. Many document interchange systems use a canonical form in document translation. A canonical form is simply a standard form that all documents can be translated into and out of. The canonical form used by a vendor can either be that vendor's proprietary form or some other standardized form. Consider for a moment a document interchange system that must handle documents from 10 different vendors. If a distinct translation program were written to translate from each vendor's format to every other vendor's format, we would need 90 different programs. The addition of an 11th vendor's format would require the development of 10 new translation programs.

If a canonical form is used, then two translation programs are

send this document to anything other than a Wang word processor, the center code will be meaningless. This is because there are no standards among vendors for text controls. If the document is being sent to some other kind of equipment, the center code must be translated to the appropriate coding for the target system. This translation can occur at the sending system, at the receiving system or somewhere in between.

Document interchange systems vs. messaging systems. Messaging systems have been with us for a long time. Almost all of us have been exposed to telex systems, and by now most of us have used computer-based message systems — software systems that provide final form store-and-forward transmission of text.

In a typical system, a user prepares a message at a standard terminal and directs the messaging system to send that message to one or more recipients. The message is stored in a message data base until each of the recipients logs onto the message system and requests his messages. At that time, the messages are displayed on the recipient's terminal or printer. The recipient can store the message, forward it to others, reply to it or delete it.

As far as the messaging system software is concerned, in almost all cases it is assumed to be talking to fairly dumb terminals. While some mail systems vendors advertise the ability to support word processors, this is oftentimes a bit misleading. What they are usually referring to is the ability to support a word processor, as long as the word processor is emulating a dumb terminal.

Compared with messaging systems, document interchange systems start with the assumption of operating on revisable form text. Furthermore, most document interchange systems assume that the text is prepared on different vendors' word processing/text processing systems and that the document format must be translated before being delivered to the recipient. The major distinction between document interchange and messaging systems is the translation value-added provided by the former.

Having explained the differences between messaging and document in-



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required for each vendor format supported. One program is required to translate from the vendor's proprietary format to the canonical form, and another program is required to translate from the canonical form to the vendor's proprietary format. When translating from Wang to Xerox, for example, one would first translate the document from Wang's format to the canonical form and then from the canonical form to Xerox's format. Naturally,

this is done in a manner that is transparent to the user. In this case, supporting 10 vendor formats requires only 20 translation programs instead of 90.

Even more important, the addition of an 11th vendor requires the writing of only two translation programs instead of 10. Use of the canonical form also provides an anchor point for precisely defining what the various word processing codes mean.

Translation services pro-

vides the ability to convert a document format from that required by one vendor's equipment to that required by another vendor's equipment. For example, when a document is sent from a Wang system to an IBM Displaywriter, somewhere in that path the document must be converted from Wang's WPS format to the Displaywriter DCA format.

At first glance, this appears to be a very trivial problem. Obviously, the

character set can be translated from Ascii to Ebcidic, and this is, in fact, a trivial part of the problem. As far as translating the document coding is concerned, an initial analysis might lead one to believe that a simple table lookup can be used for converting a center code, for example, from Wang to IBM.

Unfortunately, those building translation systems have learned that high-fidelity document translation is a very challenging problem for

a number of reasons. In order to analyze product offerings successfully, users will need to develop some understanding of these challenges.

The following factors make document translation difficult in many circumstances:

- Differences in functionality of systems.
- Differences in basic document structures.
- The syntax vs. semantics of document coding.
- Compromises between edit fidelity and visual fidelity.

Each of these is described below:

Different levels of function. Different word processing systems have different sets of features. When translating a document from a word processor that has a particular feature, such as sophisticated footnoting capability, to a system that does not, the function must be simulated. This sometimes requires the implementation of sophisticated text formatting capability within the translator.

In many word processors, footnoting is handled automatically by the word processor. The user simply keys in the footnote text, indicates that it is a footnote and ties it to the reference in the body of the text. The word processing software automatically keeps track of the footnotes and formats them at the bottom of the proper pages. When a document with this coding is translated to a system that does not support footnoting, all of the footnote tracking and formatting must be implemented in the translator.

In some cases, simulation is not possible. Consider a word processing system that allows the user to change header text anywhere in the document. If this document is sent to a word processor that only allows a single header that appears on every page, there is obviously a problem. Simulation will not help us unless we are willing to do away with the headers on the target system completely and treat the varying headers as text. This obviously impacts the revisability of the document. The most reasonable thing to do is to provide diagnostics to the recipient indicating that the headers cannot be fully converted.

Document structure. Different implementation philosophies often lead to different document structures, which can cause problems in translation. Simple character-by-character translation will be totally inadequate for most users.

Syntax vs. semantics. Because most word processors have the same basic set of document codes (center, tab, indent and so on), it is tempting to jump to the conclusion that each code can simply be



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translated into the code required on the target machine.

To understand why this is more difficult than it first appears, one must appreciate the differences between syntax and semantics. Syntax refers to the structure of the document coding; semantics refers to the meaning of that coding. While the syntax is often similar across different systems, the semantics is often quite different — that is, the very detailed interpretation of a particular code may be very different from machine to machine.

In addition, development of translators requires knowledge of what might be called "undocumented semantics." What happens, for example, when a user of a word processing system depresses the tab key after the last defined tab on the line? This depends on how the word processing software is implemented. On a Wang system, the cursor will move to the first tab position on the next line. On a Displaywriter, the tab operator will be stored in the document, but the cursor will move one position to the right. On the NBI 3000, the attempt is ignored.

While one might argue that an operator should not enter illegal sequences of operations such as the one described above, the fact is that operators quickly learn how a system responds to these sequences and often-times use this knowledge to great advantage. Clearly, translators must be able to respond precisely as the machine does. This means that high-fidelity translation requires an investment of very substantial resources in reverse-engineering each of these systems to understand exactly how it operates under a variety of circumstances.

Edit fidelity vs. visual fidelity. When translating a document, there are two potentially conflicting goals. Obviously, the document should be as revisable at the receiving system as it is at the originating station. In fact, this is the essential goal of a document interchange

system. However, there is another goal that is also rather obvious. When the document reaches the receiving system, it should look exactly the same as it did at the originating system. This is referred to as visual fidelity. Line endings should be exactly the same, page endings should be the same and so on.

Sometimes there are conflicts between these two goals, and in such cases a compromise solution must be

implemented. As an example, consider the case of translating an IBM Displaywriter document with underlined text to a Wang format. On the Displaywriter, underlined text is delineated with a start underline code and end underline code. Spaces within underlined text caused by a tab operator will appear underlined on a Displaywriter. On a Wang system, there is no way to underline the spaces caused by a tab operator.

When translating a Displaywriter document with this coding sequence (that is, a tab within underlined text), the translation program can either translate the Displaywriter tab to a Wang tab, in which case the resulting spaces will not be underlined on the Wang system, or translate the Displaywriter tab into the appropriate number of spaces so that it will be underlined on the Wang system. In the first case, revisability (that is,

preservation of the tab operator) is given preference over visual fidelity. In the second case, visual fidelity is given preference over revisability.

Another point of conflict between visual and edit fidelity arises because of differences in word wrap algorithms. Essentially, all word processing programs will perform automatic word wrapping; this means that the program determines where a line should end. The



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IN DEPTH/DOCUMENT INTERCHANGE

only time that the user enters a carriage return (also called a hard carriage return) is when word wrap is to be overridden, as in paragraph end, tables and so on.

Given the same left and right margins and pitch settings, one might think that all word processors would generate the same word wrap. This is not the case.

Some word processors consider all blanks following a word to be part of the word, some consider only the first following blank to be part of the word, and some consider none of the following blanks to be part of the word. In almost all instances, the differences in word wrap algorithms can be adjusted for by changing the right margin.

There are some cases, however, when one system would allow an additional word on a line due to a

difference in algorithms. A translator can detect this and insert a hard carriage return to force a proper line ending. Again, we have a trade-off between visual fidelity (maintaining line endings) and edit fidelity. The inserted hard carriage return is undesirable from an editability standpoint.

Typically, users are at first so delighted that they can overcome multivendor incompatibility that the small problems in translation are overlooked. However, within a short time, expectations rise dramatically, and these small problems are no longer overlooked. Such is the nature of progress: It depends on the belief that things can always be improved.

The distribution services component of the document interchange system is responsible for interfacing to the actual communications-level

software to accept the document from the sender system. It determines where the recipients are and how they are to be accessed, invokes translation services as necessary to ensure that the recipient gets the document in the format required and interfaces to the appropriate communications-level software to transmit the document to the recipient.

No matter how it is accomplished, some communications links must be established between the document interchange system and supported systems. It is important to note, however, that by supported system we can mean a stand-alone word processor or a vendor-specific document distribution system such as Disoss, Mailway and Decmail.

Interfacing a document interchange system to Disoss, as Soft-Switch does today, is but one of

many OA systems for which distribution bridges will be required. As departmental systems such as those offered by Wang, DEC, Data General Corp., Hewlett-Packard Co. and others proliferate, linkage to those vendors' mail systems will become extremely important.

The mail systems provided by each of these vendors will be used as transport services to a document interchange system. In this sense, the document interchange system becomes an intelligent bridge between departmental systems.

How does a document interchange system know that a particular user is a Disoss user or a Profs user or a Wang OIS user? Directory services is a key component of distribution services; through the directory, much of

”

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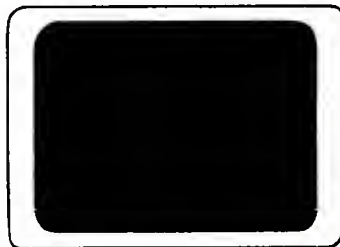
Upgradability. The ERGO 320 can accept an optional graphics board (\$595) which will perform all Plot-10 and ReGIS functions. The graphics board, which turns an

ERGO 320 into an ERGO 340, can be added to existing ERGO 320s. The small footprint is maintained when adding graphics to an ERGO 320 but must be forfeited when purchasing a VT240. **Fast, too.** In addition, our graphics offers significant speed advantages over a VT240—as much as seven times faster. (See an actual comparison above.)



ERGO 340

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DEC VT240

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the detail can be hidden from the end user. Document interchange system implementers will obviously take different approaches toward the directory issue.

It is important to note that if the end user is interacting with a departmental mail system such as Profs, the user will not interact directly with the document interchange system at all, but rather with the departmental mail system such as Profs, Wang Office and so on. The departmental system will interact with the document interchange system as necessary.

Mail system interaction

As departmental systems proliferate, document interchange systems will interact more with these mail systems and less directly with end users. This means that the user interface will be provided by the departmental system and not by the document interchange system.

This is already the case today with Disoss. Disoss has no user interface whatsoever. The Displaywriter, the 5520 and other IBM office systems implement their own user interface for document distribution and interact with Disoss as necessary.

The increasing number of different departmental/mail systems in an enterprise will lead to a requirement for another type of translation, and that is because of different user naming structures in different mail systems.

Wang Office uses a one-level name space (Mike Zisman). Disoss and Profs use a two-level name space (ADMIN.ZISMAN). Decmail uses an n-level name space (ZISMAN @ SYS1 @ SOFT-SWITCH).

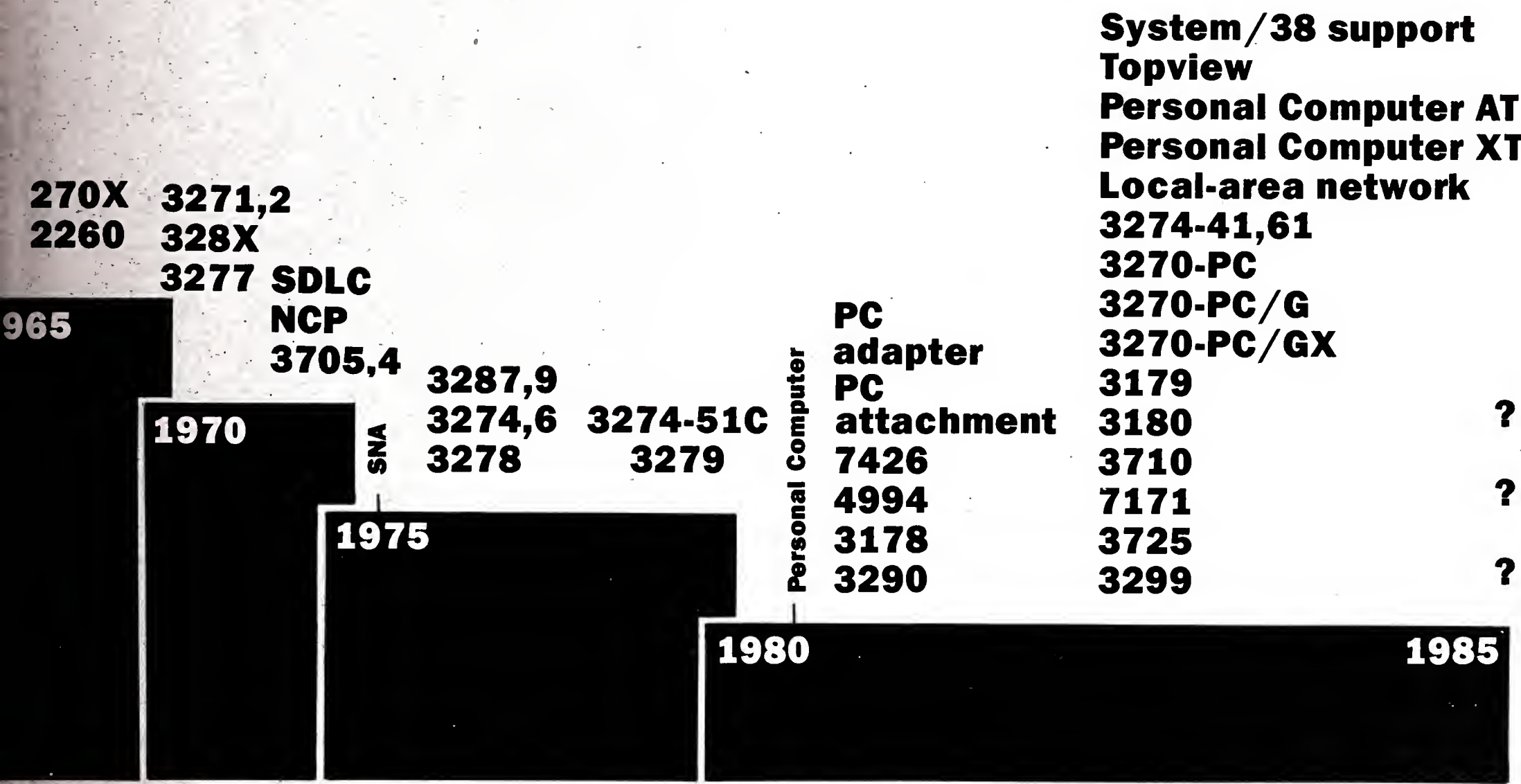
As documents are moved among systems, the names are going to have to be translated to the form required by the receiving system. User addressing in these heterogeneous mail system environments will prove an enormous problem.

About the author

Michael Zisman has been president of Soft-Switch, Inc., located in King of Prussia, Pa., since 1979. Before that, he served on the faculties of MIT and the Wharton School.

IN DEPTH

Evolution of the IBM 3270



Cycle of change speeds up

By Scott Brear

The IBM 3270 family has been available in various forms for nearly 15 years — some would even say since the introduction of the IBM 2260 display system in the mid-'60s. The 3270 products generally consist of a cluster of several editing CRTs, such as 3278 display stations, coupled to a polled cluster controller unit — the 3274, for example. Frequently, a printer such as the 3287 is also part of the cluster.

Indeed, IBM cast its lot with the earlier 2260 when it developed this concept of polled clusters over dumb and relatively inexpensive asynchronous Ascii CRTs as the principal means of user interface with IBM hosts. This direction was subsequently reflected in IBM's inattention to both asynchronous terminals and telecommunications support over the next decade — a point not missed by a generation of product planners.

This concept of small clusters of editing CRTs connected by coaxial cable to a synchronous remote or local control unit — around which millions of programmer hours of specific soft-

ware applications have been written — became popular enough to sell millions of devices worldwide. The 3270 product has become an institution with a longevity matched only by that of the omnipresent IBM 3420 which, until very recently, was the premier tape drive of IBM mainframe users. And, as with the 3420, the 3270 system has been widely emulated by major competitors offering lower prices, earlier delivery and more features than IBM.

As one might expect, the competitive scenario for 3270 products has undergone tremendous changes. No longer can competitors count on IBM's having the highest price, slowest delivery and fewest features. Some major participants have left the business or consolidated with others; some have just entered the battle armed with the skills to interface and compete with IBM, using somewhat non-traditional methods.

As the chart above shows, from 1971, when the first 3270 systems were announced, until about 1981, there was, on the average, only one

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IN DEPTH/IBM 3270

major product announcement each year. In fact, a full five years separated the announcement of the first-generation 3271- and 3272-based clusters and the release of the second generation, generally represented by the 3274 cluster.

Five years later, just when users were expecting a new product line, they were greeted with several major 3270 enhancements in what became one-year, then six-month and now three-month cycles.

The magnitude of the 3270 system explosion can best be understood when divided into functional segments, such as:

- Basic 3270 components.
- Personal computing.
- Protocol conversion.
- Coaxial cable-based technology.

The basic 3270 cluster components have changed considerably since their introduction in terms of flexibility and features. The explosion first brought a low-cost 3178 12-in. display station. After many years of offering large, inflexible displays, the 3178 was welcomed for its smaller size and ergonomic features, such as a swivel mount for user convenience. In fact, the 3178 closely resembled the IBM 3101 display terminal, an asynchronous CRT device.

The 3178 was also significant for its highly competitive pricing, including volume discounts, and user self-installation and maintenance plans. There is no question that the 3178 stunned the competition, which then rushed their own low-cost displays into the marketplace.

Along with the 3178 came the 3290 information panel, which was able to display as many as four regularly sized CRT images simultaneously, using flat-panel plasma technology. The 3290, which cost more than twice as much as regular 3278 displays, was not about to be a widespread replacement. Rather, it served as a useful computer room or unique applications tool, while at the same time demonstrating IBM's technological prowess to trade show audiences.

The 3270 control unit products were also enhanced to use new products and features, such as the 3290. The 3274 control unit was offered in new Model 41C and 61C versions with more memory, more standard features and a lower cost. For example, the 3274 control unit entry assist function was added as a user convenience, giving some word processing capabilities to on-line data entry operations.

Significantly, the small System/38 now supports the 3274 Systems Network Architecture/Synchronous Data Link Control (SNA/SDLC) cluster, providing access to applications that once required a specialized 5251 display station to access. Software in the System/38 converts 3270 data streams for the 5251 applications.

Does this portend a move to a single family of display stations? Perhaps this move is not too far away if one considers some features of the new 3180 display station family. For example, the 3180-1 has been announced as a replacement for the 3278, while the 3180-2 is intended to replace the 5251 for System/34 and System/38 hosts.

The displays are essentially the same in physical terms, but are differentiated by software downloads that can determine keyboard assignment and other operational parameters relevant to their hosts.

The 3180-1 display station and its companion 3179 color display station announcement were significant for other reasons as well. Serious inroads were being made in the 3270 market by several competitors who could offer all of IBM's display sizes — 80 char. by 24 char. through 132 char. by 27 char. — in one device, saving inventory and money and greatly improving user flexibility.

The 3180-1 met this challenge by providing the ability to display any standard screen size on one 15-in. ergonomic terminal. And, if this were not enough, prices came down again. The 3179 was also welcomed by IBM users as it offered a fresh-looking, lower priced alternative to the older, bulky 3279 color product.

Perhaps personal computer users have had the greatest impact on the 3270 system by challenging the pre-

eminence of the existing large host and cluster controller computing environment while urgently seeking access into this same environment. Very soon after the Personal Computer was announced, the industry was speculating as to how and when it would be interfaced with the 3270 product line. It seemed, by many, to be a natural fit.

This speculation ended when the Personal Computer attachment product was announced but was soon followed by disappointment as users realized that this product was a complex "bolt-on" to existing 3278 display stations.

The Personal Computer has been a success, with an installed base approaching two million and expected to reach a possible 15 million units in a few years. Data processing managers were not expecting this potential

threat to their domain to become a powerful extension via their 3270 systems and software. But the capability was there. Coaxial cable adapter cards and software, the IBM Personal Computer 3278/79 emulation adapter, became available, which enabled the Personal Computer to emulate directly a 3270 display station.

File transfer became an issue as users realized the usefulness of freely moving files between their hosts and the new little helper; however, users were unhappy to learn about limited file types, relatively slow transfer speed and threats to host data base integrity.

Finally, a completely integrated product, the 3270 Personal Computer, was announced that combined the host-interactive functions of the 3270 information display system and the computing power and versatility

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IN DEPTH/IBM 3270

of the IBM Personal Computer. The 3270 Personal Computer offered single-session operation (the control unit terminal mode) or a unique multisession mode (the distributed function terminal) where one 3270-PC could interface with as many as four 3270 sessions. This feature, also used with the 3290 information panel, was expanded to allow two notepad sessions and one DOS Personal Computer session.

The 3270-PC also had screen windowing, keyboard macro definition, file transfer and many other useful features. Since the original announcement, several powerful graphics versions of the 3270-PC have been introduced and widely promoted for special-purpose applications.

Terminal interfacers unit

IBM offers protocol conversion? Yes, and it has for several years, if protocol conversion means enabling asynchronous terminals to talk to 3270 applications. It seems that the IBM 7426 terminal interfacers unit, released in October 1982, was IBM's first real venture into protocol conversion, providing a remote or loop-connected facility for the connection of a limited number of asynchronous devices, such as its own 3101 asynchronous terminal.

On the other hand, the Yale Package — an IBM Series/1 minicomputer with Yale University-created software, available on a special quote basis — became the IBM 4994, an Ascii device control unit. Apparently, this happened when IBM granted

it formal product status. Only IBM knows how successful it was with the 4994, since market figures are buried in Series/1 statistics, but there were some limitations, such as the type of terminals to which the 4994 could interface.

In addition, IBM offers a synchronous communications adapter board and software that converts the Personal Computer into a 3270 display station/control unit running either Binary Synchronous Communications or SNA/SDLC. Of course, running full steam against all of these offerings are the protocol converters of dozens of companies claiming to offer lower price, faster delivery, more features and wider terminal support.

Just when everything looked safe for participants in this small subsegment of the 3270 market, the IBM 7171 Ascii device attachment control unit was announced. The 7171, which adds significant credibility to the concept of the 3270 protocol conversion, replaces and greatly improves on the 4994, in terms of price and features. For example, the 7171 can directly connect to host channels as a pair of 3274 control units offering 3270 emulation to 64 Ascii terminals via direct connection, asynchronous dial modems, line drivers or data private automatic branch exchanges.

Host and software limitations were removed, but the 7171 is still a locally attached product inapplicable to more than three-quarters of all of the 3270 applications that exist in a remote synchronous network envi-

ronment. However, IBM has placed the burden of dial-in security totally on the host; the 7171 has no password or other types of security common in today's protocol converters.

Furthermore, the 7171 entry size of 16 channels will make it a solution for only very large users. Nevertheless, IBM has turned over one more stone in its efforts to control the 3270 market.

Multiplexer unit

Coaxial cable technology has not stood still either. While not a leader in innovative coaxial cable products, IBM finally offered a 3299 terminal multiplexer unit that allows up to eight devices to share a single 5,000-ft. coaxial cable line. Offered by a few competitors for several years prior to the IBM announcement, the 3299 offered significant savings where coaxial cable runs can cost up to \$1 per foot to install or where no room for expansion exists.

There are alternatives from other vendors, such as multipoint coaxial cable attachment, but IBM's local-area network product, when available, should allow the faithful to move in this direction as well.

Users now have an assortment of coaxial cable devices to choose from when configuring their 3270 systems. Not only can the Personal Computer have an expansion board giving it 3278/3279 emulation, but products are available from certain creative competitors that allow virtually any asynchronous Ascii device to emulate 3270 displays or printers.

What's next? Is a new 3274 control unit on the horizon? Only IBM knows — and it is not talking. The product family will not die soon; there are too many software applications written. Remember, it has taken IBM nearly 10 years to withdraw Tcam telecommunications access method support. But it will probably evolve into a much more flexible product with features now available with the more expensive 3270-PC.

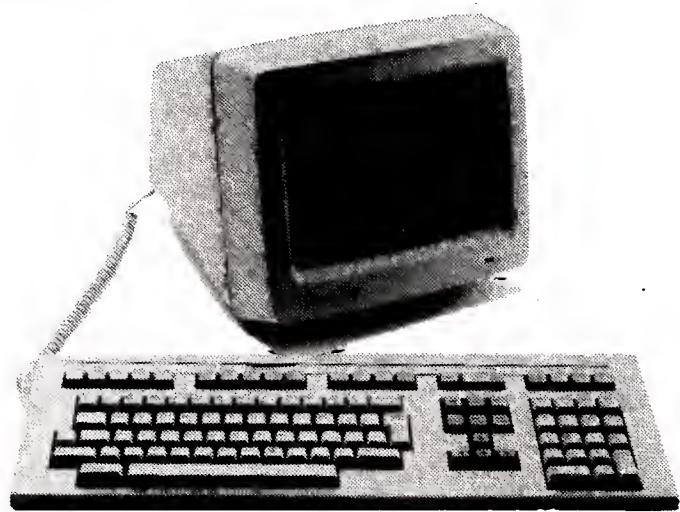
A single clustered terminal family will probably apply across all IBM products, making the 5251 product virtually obsolete. The concept of file transfer, which today has been shoehorned into the capabilities of existing hardware and software, will be expanded into a highly functional user tool controlled by mainframe data processing managers.

Finally, networking concepts will change as users become comfortable with the new local-area network technologies and new networking products such as the IBM 3710 network controller.

The 3710 should not go unnoticed by 3270 managers, since this remotely connected device can look like a 3725 communications control unit to 31 Model 3274 control units or protocol converters. And, as IBM indicates in its 3710 product announcement, it "intends to provide . . . full screen protocol conversion capabilities integrated within the 3710."

About the author

Scott Brear is director, protocol conversion products, at Micom Systems, Inc. in Simi Valley, Calif.



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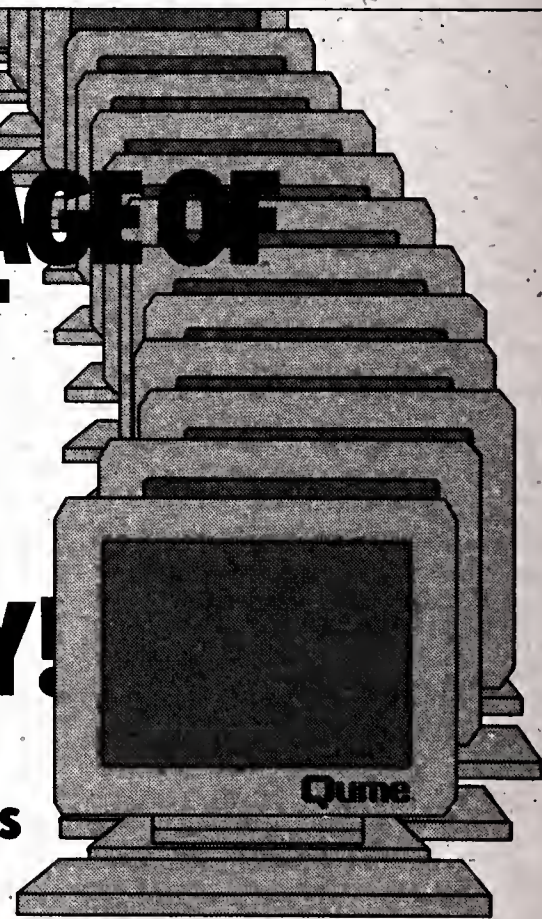
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SYSTEMS & PERIPHERALS

Fujitsu's VP-400 supercomputer out; called fastest CPU

TOKYO — Fujitsu, Ltd. recently announced that it has developed the VP-400 supercomputer, which Fujitsu claims is the first supercomputer to perform one billion floating-point operations per second (Gflops), twice as powerful as the fastest Fujitsu supercomputer now available.

The VP-400's speed, measured by the Japanese National Aerospace Laboratory of the Science and Technology Agency, Fujitsu maintains is the world's fastest. However, scientists caution that speed varies with the problem being solved, so the rating varies in practice.

Fujitsu currently offers two supercomputers, the VP-100, rated at 250 million floating-point instructions per second (Mflops), and the VP-200, rated at 500 Mflops.

The corresponding processors from Amdahl Corp., which markets and supports Fujitsu processors in the U.S., are the Amdahl 1100 and the Amdahl 1200.

'No surprise to us'

Wayne McIntyre, director of special-purpose systems for Amdahl, said, "We've known about the product for some time. It was no surprise to us." Expecting that Amdahl will market the VP-400 in the U.S., he said a final agreement has not yet been reached with Fujitsu.

The performance of the VP-400 was achieved by packing more processors in the box, rather than by accomplishing a scientific breakthrough. The VP-400 uses bipolar emitter-coupled logic with 400 gates per chip and has a switching speed of .35 nsec, McIntyre said.

The Amdahl executive predicted that the VP-400, when offered in the U.S., will have an impact on the domestic supercomputer manufacturers, Cray Research, Inc. and Control Data Corp.

The fastest Cray Research, Inc. supercomputer is the X-MP/48 with four processors, rated at 10 times the speed of the Cray 1, according to Cray's manager of corporate communications, Tina Bonetti.

Cray does not issue Mflop ratings for its CPUs, because the rating will vary by application, according to Bonetti.

IBM, DEC fight brews

Report sees increasingly stiff competition for small, mid-range areas of systems market

By John Desmond
CW Staff

FRAMINGHAM, Mass. — The already heated battle between IBM and Digital Equipment Corp. will intensify in 1985 as both companies attempt to make the transition smoothly from proven, older technology systems to new-generation machines such as DEC's VAX 8600 and IBM's so-called Sierra line of mainframes and Personal Computer AT.

According to "Review and Forecast, Part III," a report published by International Data Corp. (IDC), a market research and consulting firm based here, issues that will affect the DEC-IBM duel during 1985 include the following:

■ Because IBM is dominant in the mainframe and personal computer markets, most competition will occur in the small- and medium-systems

market, where DEC and IBM were nearly equal in 1983.

■ IBM's share of the market fell in 1983 to 38.5% from an estimated 40.5% in 1982.

■ Of worldwide processor shipments of \$43.9 billion in 1983, personal computers comprised 26.3%; small systems, 19.1%; medium systems, 21.6%; and large systems, 33%. Five-year growths, from 1983-1985, are projected at 32%, 21%, 10% and 9%, respectively. (IDC defines small systems as those having two to 16 users; medium, from 17 to 128 users; and large, more than 128 users.)

IDC is estimating that the value of worldwide 1984 shipments will total some \$53.2 billion, up 21.2% over the \$43.9 billion shipped in 1983. IDC forecasts that the total value of computer system shipments will grow at

See IDC page 67

■ ZAX Corp. offers a micro-processor development system based on DEC's Microvax-1/62

■ The Corporation for Distributed Systems announces a data collection system for shop floor applications/66

INSIDE

Turnkey
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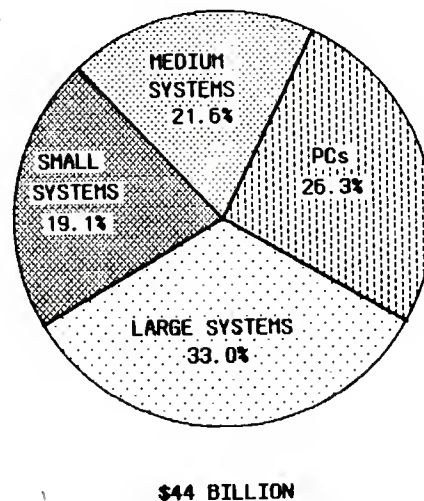
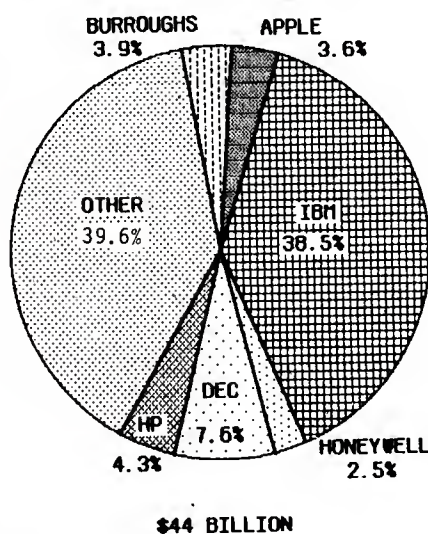
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VALUE OF COMPUTER SYSTEM SHIPMENTS, 1983



IDC CHART

Supercomputing requires some study



The latest trend among vendors of large-scale mainframes is to offer users the option to add a scientific processor to boost performance. The idea clearly has merit considering the increasing demands for simulations and other computer-intensive applications that have recently appeared in even the most commercially oriented shops. But a question that has yet to be answered is whether users from traditionally commercial processing environments are ready to learn how to use powerful scientific systems.

Longtime manufacturers of IBM-compatible mainframes, Amdahl Corp. and National Advanced Systems Corp. (NAS), are each currently marketing scientific processors that offer performance similar to the stand-alone supercomputers manufactured by Cray Research, Inc. and Control Data Corp. But in addition to offering the ability to quickly process complex number-crunching applications, the Amdahl and NAS scientific proces-

sors, which are manufactured by Fujitsu Ltd. and Hitachi Ltd. respectively, offer compatibility with IBM's 370 instruction set. That compatibility appears to offer a bridge linking the heretofore separate worlds of commercial and scientific processing.

But just giving commercial users the ability to run sophisticated scientific applications is only part of the issue. In order to make expensive scientific processors pay for themselves, users must first clearly understand how they work. For example, supercomputers can run some types of applications much more efficiently than standard mainframes, but there are other applications that will actually run more slowly on a supercomputer. There are software packages, such as pre-compilers, that help the user decide which applications will run best on a supercomputer, but they are not foolproof and are not replacements for a sound knowledge of supercomputing.

Software is a general sore spot when it comes to supercomputing. Up until now, the traditional supercomputer user has been very sophisticated and very specialized. Consequently, there has not been a mass market for third-party supercom-

See COLUMN page 66

Bell & Howell boosts image storage system

CHICAGO — The Electronic Image Processing Department of Bell & Howell Co. has announced added disk storage capacity for its Data Search System for image retrieval.

The system uses Bell & Howell cameras to record images on microfilm, Digital Equipment Corp. computers for data processing and disk drives to store key words in an index. The Series 10 and 20 use the DEC Micro PDP-11; the Series 30 uses the DEC PDP-11/23+; and the Series 40 uses the DEC PDP-11/24.

The Series 10, 20 and 30 Data Search Systems have been enhanced as follows: Model 3 with a 10M-byte Winchester disk drive; the Model 4 with a 31M-byte Winchester drive; Model 5 with a 52M-byte Winchester drive, of which 26M bytes are fixed and 26M bytes are removable; and Model 6 with a 104M-byte Winchester drive, of which 52M bytes are fixed and 52M bytes are removable, the company said. Models 5 and 6 have been added to the Series 40 line, the company said.

The price for a Series 10 Model 1 with a Micro PDP-11, 800K bytes of disk storage, camera, reader/printer and CRT, is \$35,000, the company said.

More information is available from Bell & Howell, Electronic Image Processing Department, 6800 McCormick Road, Chicago, Ill. 60645.

SYSTEMS & PERIPHERALS

Beehive offers terminals emulating DEC, IBM VDTs

SALT LAKE CITY — Beehive International, Inc. has announced three terminals: the ATL-220, said to emulate Digital Equipment Corp.'s VT220 terminal; the ATL-178, said to emulate IBM's 3178 terminal with an integral controller; and the ATL-3270 MS, which emulates the IBM 3270 terminal with an integral controller.

All three terminals have a 14-in., nonglare, adjustable screen in either green or amber phosphor. Other features include a tilt-and-swivel pedestal and a low-profile, detachable keyboard.

The ATL-220 allows operating features to be selected from a menu and then stored in nonvolatile memory. The terminal can be used to modify

communications protocols, interfaces, tab settings, printer controls, function-key definition and keyboard parameters. The ATL-220 has five operating modes: DEC VT200 7-bit control mode, DEC VT200 8-bit control mode, DEC's VT220 version of the VT100 mode, a true VT100 mode and a DEC VT52 mode, the company said.

The ATL-220 features an antiglare filter, enlarged CRT cell and matrix size, optional tilt-and-swivel monitor and optional RS-422 capability.

The price for any ATL-220 terminal is \$1,095, the company said.

The ATL-178 workstation is said to include plug-compatible Category A coaxial cable features, which re-

portedly allow communication at speeds up to 250K bit/sec. Beehive's ATL-178 attaches to IBM's 3274 Category A coaxial cable-based cluster controller and any third-party IBM-compatible Category A coaxial cable controller, the company said.

Features of the ATL-178 include a row and column indicator, an optional keyboard configuration, emulation of keyboards in the terminal, rather than through an external controller, a 14-in. screen with antiglare filter, and tilt-and-swivel control. The price for the ATL-178 is \$1,395, the company said.

The ATL-3270 MS is a dual-host, multistation terminal said to emulate the IBM 3276 Model 2 or Model 12.

The workstation is said to combine 3270 capabilities with an integral, four-channel version of the Beehive CC74 cluster controller.

Using RS-232 or RS-422 cabling, the ATL-3270 MS can be connected to four Ascii terminal devices, including Beehive's ATL-078 with Ascii emulation of the IBM 3278, the ATL-220 emulating the DEC VT220, the ATL-004 with Ascii emulation of VT100 mode, the Beehive Topper dual-mode microcomputer, as well as IBM Personal Computers, the company said.

The price for the ATL-3270 MS with Binary Synchronous Communications capabilities is \$2,795, and the price with IBM's Systems Network Architecture compatibility is \$2,995, Beehive said.

More information may be obtained from Beehive International, 4910 Amelia Earhart Drive, Salt Lake City, Utah 84125.

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Bennett of Rockwood Systems, who defines four dominant forces likely to dictate the future of business computing.

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(617) 879-0700

ZAX 32-bit development system debuts

IRVINE, Calif. — ZAX Corp. has announced a 32-bit microprocessor development system, featuring the ZAX In-Circuit Debugger (ICD) series in-circuit emulators and Digital Equipment Corp.'s Microvax-1 CPU.

Development software for the ZAX/VAX connection includes C, Pascal and Microtec Research, Inc.'s PL/M 86 high-level language support, manufacturer-compatible cross-assemblers and a ZAX interface called Zice. Zice is said to feature symbolic debugging capability, batch file control of the emulators, automatic journaling and Help features.

The combination of Microvax-1 development software and ZAX emulators is said to allow for full software development and hardware/software integration. The Microvax-1 development system package includes: DEC's Microvax-1, 2M bytes of random-access memory, a 31M-byte hard disk, a disk controller, 8-port RS-232 controller, 400K-byte floppy disk and DEC's Micro VMS software and license. The price for the package is \$21,435, the vendor said.

The ZAX in-circuit emulators are currently available for Intel Corp.'s 8086, 8088, 8085 and 8048 microprocessors, as well as Motorola, Inc.'s 68000, 68010 and 68008 microprocessors and Zilog Corp.'s Z80 microprocessor.

The ZAX in-circuit emulators come equipped with 2K bytes or 4K bytes of real-time trace buffer, an event trigger that prequalifies breakpoints, emulator overlay memory and breakpoint capabilities.

Prices for the emulators range from \$4,995 for the 8-bit version, to \$7,995 for the 16-bit version. A typical three-user ZAX/VAX development system, including high-level languages and cross software, 8-bit and 16-bit emulators and terminals costs \$56,000, the vendor said.

More information is available from ZAX, 2572 White Road, Irvine, Calif. 92714.

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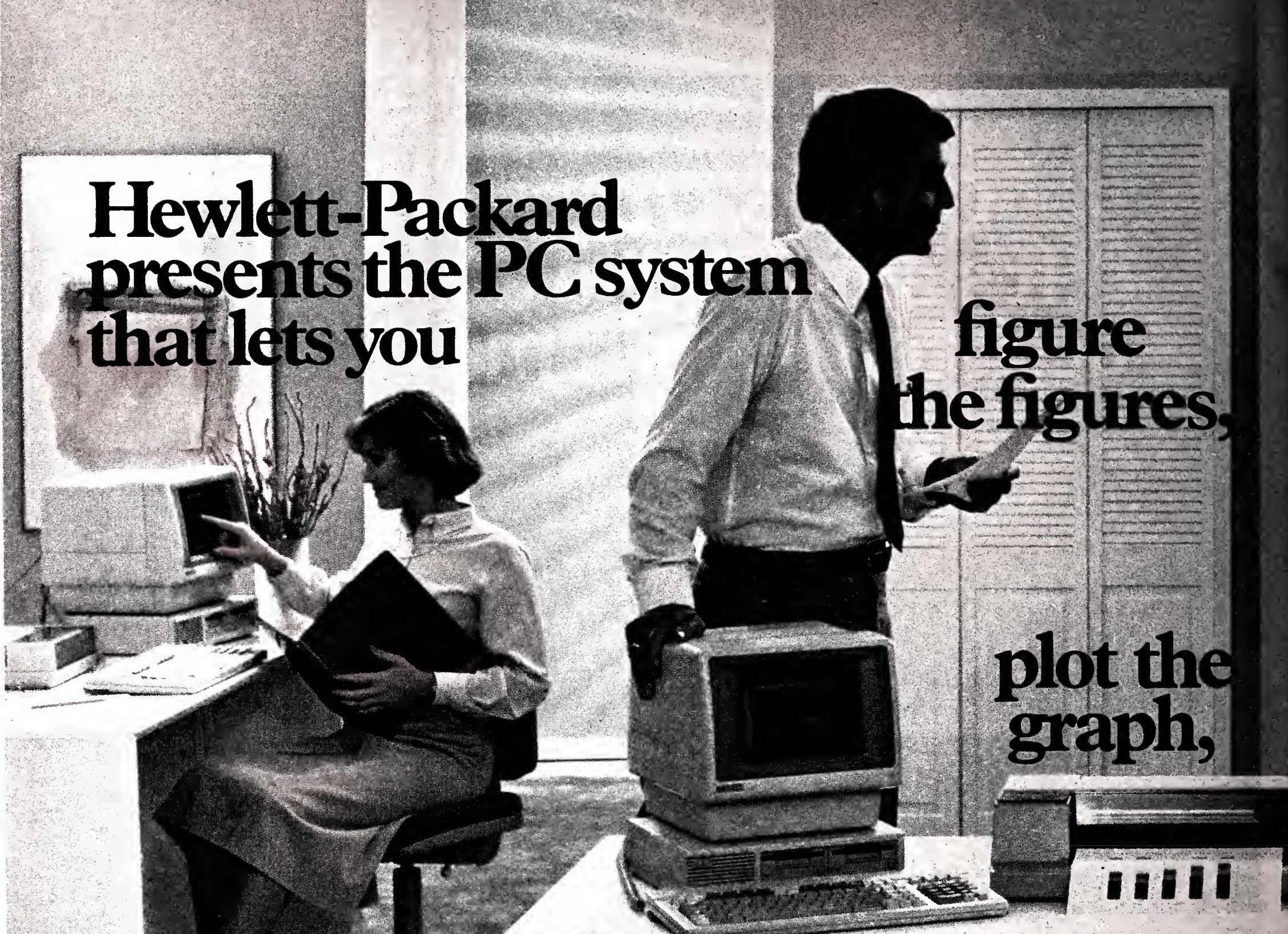
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It all starts with two of our Hewlett-Packard personal computers.

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The first comes with two double-sided disc drives that give you 256K bytes of main memory, expandable to 640K bytes.

The HP Touchscreen MAX has even more capacity, with the added power of a 14.8M byte Winchester disc drive.

And both have DSN/Link, to let you set up a direct line of communication between them and your HP 3000 Department Computer.

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ers many people think are simply the best around.

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print
the report

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Two different plotters are also part of the HP personal computer system.

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Hewlett-Packard's portable personal computer turns your hotel room (or your den at home, or your customer's desk) into another part of your personal computer system.

The Portable has plenty of capacity; 272K bytes of RAM and 384K bytes of ROM. And with its built-in modem, it can link you with your office printers and plotters. Not bad for a computer that weighs just nine pounds and can fit into a briefcase.

The system is all linked up, all on the same programs, all designed to work together, and all ready to go.

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**HEWLETT
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SYSTEMS & PERIPHERALS

CDS unveils Linx production data collection system

Features programmable processor and memory, bar and magnetic stripe card readers

SOUTH SHERMAN, Texas — The Corporation for Distributed Systems (CDS) has announced the Linx system for the collection of production data on the shop floor. The unit is said to perform a variety of tasks ranging from collection of work-in-progress data to the control of machines and processes.

Linx accepts data from its integral bar code or magnetic stripe card reader, sealed keypad or external devices. A programmable processor and memory is said to allow Linx to be tailored to each user. The system is based on the 8-bit Zilog, Inc. Z80 microprocessor.

Features include a fault-tolerant network architecture, nonvolatile program storage and rugged construction, the firm said. In addition to the bar code and magnetic stripe readers, Linx can be configured for bar code wands or laser scanners and an RS-232C or RS-422 port for host computer, peripheral or intelligent machine controller communications.

Data may also be entered through the sealed, splash-proof, 20-key keyboard. Operator interface and prompting is accomplished through four function keys, six control keys, a high-intensity LCD and a program-controlled audio feedback.

Each Linx station can be independently programmed and can operate individually in local-area networks or in linked networks, the company said. The Linx network uses High Level Data Link Control data packets transmitted over an RS-485 or industrial-grade RS-422 network.

Power distribution

Power is distributed to Linx units through the same cabling as the communications network, eliminating the need for electrical outlets for each station. Power options available include individual unit power supplies, supplies for up to eight net-

work units and uninterruptible supplies.

Optional features for Linx include high- or medium-density infrared or visible wand readers, laser scanner with interface and power supply, up to 16K bytes of memory and real-time clock with battery backup.

The price for a base unit with keypad, 32-char. display, bar code slot reader, 2K-byte internal buffer, 512K-byte double-erasable programmable read-only memory, data collection application generator and network interface is \$695.

CDS is located at 750 S. Sherman, Dallas, Texas 75080.

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TURNKEY SYSTEMS

DIGITAL TECHNIQUES, INC. Model 428 Advanced Systems Monitor

Digital Techniques, Inc. has announced the Model 428 Advanced Systems Monitor, said to provide support systems information to data centers. The product is based on the Zilog, Inc. 8-bit Z80 microprocessor. A Remote Signal Module feature collects data on air conditioning, security, fire, safety and electrical power deviations, the company said.

Prices begin at \$11,000.

Digital Techniques, P.O. Box 3128, 2510 Professional Drive, Richmond, Va. 23235.

DATA STORAGE

ACKNOWLEDGE, INC. AN-9000-PC tape file transfer system

Acknowledge, Inc. has announced
Continued on page 67

COLUMN from page 61

puter software. Now that Amdahl and NAS offer scientific processors compatible with IBM's 370 instruction set, more software developers may be willing to develop specialized packages. In fact, many industry observers believe IBM may also soon add some sort of scientific processor to its current mainframe lineup. Such a move would provide a strong incentive for software vendors to develop specialized packages. But for now, many users may find they have to either develop their own scientific software or make fairly significant enhancements to off-the-shelf packages to meet corporate needs.

Clearly, the first users to jump at the opportunity to buy a 370-instruction-set-compatible supercomputer will be shops that are already doing enough scientific processing to realize they could reap a significant gain in productivity by doing so. So, the idea of a complete novice suddenly being thrust into a supercomputing environment is somewhat extreme. But even with a fundamental knowledge of scientific processing, most users used to a primarily commercial processing environment will have a lot to learn before becoming proficient at supercomputing.

SYSTEMS & PERIPHERALS

Continued from page 66

the AN-9000-PC 9-track magnetic tape subsystem for transferring files between mainframes and personal computers from Wang Laboratories, Inc. or IBM.

The AN-9000-PC subsystem includes an intelligent interface card, Alloy Computer Products, Inc.'s Tip/Six utility software and tabletop or rack-mountable 9-track tape drive. The interface card occupies a single slot in the IBM or Wang micro. The 9-track tape drive is compatible with processors from IBM, Digital Equipment Corp., Hewlett-Packard Co. and Data General Corp.

The Tip/Six software is said to allow data records to be converted from Ebcidic to Ascii format. The self-loading and self-threading tape drive reportedly provides disk-to-tape transfer at a rate of 0.7M byte/min, with up to 42M bytes of backup or working storage.

The AN-9000-PC costs \$8,995.

Acknowledge, 100 Pennsylvania Ave., Framingham, Mass. 01701.

TERMINALS

PRECISION VISUALS, INC.
Raster terminal driver

Precision Visuals, Inc. has announced a driver for users of the Seiko Instruments U.S.A., Inc.'s GR-1104 color raster terminals with the DI-3000 and GK-2000 graphics tools packages.

The Seiko GR-1104 is a 14-in., 1,024- by 780-pixel resolution terminal capable of displaying 512 colors, the vendor said. The terminal is intended to produce presentation-quality business graphics as well as scientific and engineering applications.

IDC from page 61

a compound annual rate of 18.1% over the 1983-1988 period, when shipments are projected to reach \$122 billion, not including software, service and maintenance.

From a performance point of view, DEC's 8600 cuts the IBM processing power lead. The IBM 3084 mainframe has 30 times the power of DEC's VAX-11/780, but only seven times the power of the 8600, in IDC's estimation. But IBM's awaited top-of-the-line mainframe series is expected to push the lead back to 14 times the power of the 8600, IDC said.

In the medium market, 13 vendors have between 1% and 7% of the market, and in the small-scale market, 14 vendors have between 1% and 7% of the market, according to IDC. The small-scale systems market is projected by IDC to expand 20% per year over the 1983-1989 period, in value of worldwide shipments. In 1983, an estimated 376,000 small-scale systems were shipped worldwide, 62% of them into the U.S. market.

The economies of small systems favor AT&T's Unix operating system because many small-scale customers are new customers and have no need to stay compatible with an installed base, IDC said. Small-scale systems are feeling market pressure from micros, but for many applications, multiuser systems are more cost-effective than getting each user a micro.

The report is available for \$375 from IDC, Five Speen St., Framingham, Mass. 01701.

Hardware features supported by the drive include polygon fill, with 10 fill patterns plus solid colors; block and italic fonts in 16-char. sizes, eight colors and line styles; and five marker types.

An escape function in the drive is said to allow printing either graphics or text displayed on the screen. Other escape functions include drawing arcs, circles, sectors, rectangular lattice point patterns and text to be printed in four directions.

The price for the GR-1104 device drive is \$650 in the U.S.

Precision Visuals, 6260 Lookout Road, Boulder, Colo. 80301.

INDUSTRIAL ELECTRONIC
ENGINEERS, INC.

Plasma display for Argus Aim family

The Industrial Products Division

of Industrial Electronic Engineers, Inc. has announced the addition of a 4-line by 20-char. alphanumeric display module to its Argus Aim family of dc plasma displays.

The Model 3402-05-080 features 5- by 7-dot-matrix characters, a bidirectional Ascii interface and software-controlled dimming.

The Argus Aim family consists of a series of Ascii-interface flat-panel alphanumeric display modules, employing dc plasma technology. The format can display the full 96-char. Ascii set, including uppercase and lowercase letters, numbers and symbols.

The Model 3402-05-080 measures 6.5 in. by 3.6 in. by 1.75 in. The price for the product in quantities of 100 is \$457, the vendor said.

Industrial Electronic Engineers, Industrial Products Division, Sales

Office, 7740 Lemona Ave., Van Nuys, Calif. 91405.

ELECTRO STANDARDS
LABORATORY, INC.

Model 9316 switching system

Electro Standards Laboratory, Inc. has announced the Model 9316 16-channel switching system for IBM 3270-type information display systems.

The Model 9316 is intended to accept inputs from up to 16 IBM 3278-type display stations and switch them either in bulk to controller A or controller B, or to switch them in a preprogrammed mix between controller A and controller B. When in the mix mode, individual channels may be switched.

The price of Model 9316 is \$1,050

Continued on page 68

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SYSTEMS & PERIPHERALS

Continued from page 67

as a rack-mount unit and \$1,100 as a desktop unit.

Electro Standards Laboratory, P.O. Box 9144, Providence, R.I. 02940.

DATEM LTD.**DDCM100 CRT Display Controller**

Datem Ltd. has announced the DDCM100 CRT Display Controller, said to provide OEMs with a programmable, custom, alphanumeric display subsystem compatible with Intel Corp.'s Bitbus distributed control network.

The module is said to provide a serial interface, dual 80-char. by 25-line display memory, CRT timing and refresh circuitry and an integrated display interface task. The unit is also said to allow OEMs to implement custom display systems that may be connected to the Bitbus in a variety of hierarchical control systems.

The price for DDCM100 is \$686.

Datem, 148 Colonnade Road, Nepean, Ontario, Canada K2E 7J5.

PRINTERS/PLOTTERS**VERSATEC, INC.****V-80, V-80F enhancements**

Versatec, Inc. has enhanced its V-80 and V-80F (film version) printer/plotters with an automatic toner concentrate addition.

According to a spokesman, automatic concentrate addition maintains

consistent output image density without operator intervention, a feature especially useful in remote plotting applications. When image density falls below a preset level, toner concentrate is automatically added. If the user desires higher density, a manual override provides for the addition of more concentrate.

The spokesman said the V-80 can plot an A-size drawing in 8.5 sec and a B-size drawing in 17 sec. It prints bills of materials, schedules and listings at up to 1,000 line/min on roll or fan-fold paper. All V-80 models include a self-testing feature initiated from the operator panel.

Interfaces are available for Digital Equipment Corp., Data General Corp., Hewlett-Packard Co., IBM, Perkin-Elmer Co. and other computers. V-80 prices begin at \$8,950.

Versatec, 2710 Walsh Ave., Santa Clara, Calif. 95051.

NICOLET COMPUTER GRAPHICS**Zeta 824CS, Zeta 836CS pen plotters**

Nicolet Computer Graphics, a division of Nicolet, has announced two drum-type pen plotters, the Zeta 824CS and Zeta 836CS, said to offer single-sheet media feed and roll feed.

The 824CS handles media up to 24½-in. wide, plotting American National Standards Institute sizes A through D and International Standards Organization sizes A4 through A1, the vendor said. The 836CS has a 34-in. drum, adding Ansi E and ISO A0 to the drawing sizes handled, the company said. Vector speed of 25 in./

sec, and resolution of 0.001 in. or 0.0025 in. is available, the vendor said.

Both plotters have all eight pens mounted on the carriage. Standard interfaces are RS-232C and IEEE-488. A P87 option supports interface with an IBM 3274/3276 cluster controller via coaxial cable.

The Zeta 824CS is \$11,900, and the Zeta 836CS is \$14,900.

Nicolet Computer Graphics, P.O. Box 3020, Martinez, Calif. 94533.

GRAPHICS SYSTEMS**CAECO****Designer III Workstation**

Caeco, a division of Chromatics, Inc., has introduced a workstation said to be designed for very large-scale integration design.

The Designer III Workstation is an integrated hardware/software system built around a Sun Microsystems, Inc. Model 2/120 supermicrocomputer utilizing the University of California at Berkeley Unix 4.2 and including Chromatics' Model CX-1400 high-resolution color graphics display system.

Other available options include support for several peripherals, including Xerox Corp.'s Ethernet local-area network, a 9-track tape, ¼-in. streamer tape, Versatec, Inc. plotter, color ink-jet plotter and line printers.

Resident on the Designer III is the editor of the vendor's Caepac I soft-

ware, which is said to incorporate a specialized form of symbolic representation.

With the program, symbols representing actual geometries only show the critical boundaries of the component. The other geometries, although present in the data base, are normally suppressed but can be viewed by the user if wanted, the vendor noted.

Prices start at about \$70,000.

Caeco, Suite 280, 1160 S. State St., Orem, Utah 84058.

CASCADE GRAPHICS DEVELOPMENT**Cascade VII**

Cascade Graphics Development has announced the Cascade VII computer-aided drafting system running the company's Speedware software, based on the Motorola, Inc. 68000 microprocessor and the NEC Information Systems, Inc. 7220 graphics processor.

The system's features include dual monitors, one for display of command menus and a color monitor for display of graphics; a 10M-byte hard disk and floppy disk drive; and graphics tablet. Resolution on the 14-in. monitor is 640 by 400 pixels. The CPU has 1M byte of random-access memory.

The price for Cascade VII, with a California Computer Products, Inc. 1043 eight-pen plotter, is \$30,000, the vendor said. The price without the plotter is \$24,000.

Cascade Graphics Development, 1000 S. Grand Ave., Santa Ana, Calif. 92705.



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MICROCOMPUTERS

Microsoft: PC-DOS release will solve start-up bugs in AT drive

By Edward Warner
CW Staff

BELLEVUE, Wash. — The new version of IBM's PC-DOS, scheduled for release this quarter, will avoid start-up bugs for the enhanced Personal Computer AT's hard disk drive.

That announcement, from PC-DOS developer Microsoft Corp., is the latest to arise in response to a series of user complaints about the 20M-byte disk drive.

Customers have complained of faulty data sectors cropping up, either during start-up or weeks later, but IBM said the incidents are isolated.

Operating system claimed not at fault

Microsoft vehemently denied that the operating system is to blame, but the company will make an automatic fix in PC-DOS 3.1, according to Chris Larson, MS-DOS product marketing manager.

At present, AT users who get the response of "Format Failure" when they partition their disk drives during start-up must perform a "work-around" made

up of several DOS commands. This compensates for a larger than expected number of faulty data sectors on the 20M-byte hard disk, Larson claimed.

He explained that the work-around must be performed manually because the start-up portion of PC-DOS 3.0 remains unchanged from Version 2.0, which he said worked without problems with the 10M-byte hard disk unit of the IBM Personal Computer XT.

Faulty data sectors a general problem

According to an IBM spokesman, faulty data sectors are a problem on any hard disk unit, and the AT's drive is being shipped with at least 21.8M bytes of usable storage space.

Larson maintained that the blame for the hard disk drive failures rests with the hardware. "In no way is DOS causing the problem," he said. "The failure rate appears to be much greater on the 20M-byte drives," than it was on the 10M-byte drives of the Personal Computer XT.

See **DISK** page 73

IBM PC Xenix starts shipping

BOCA RATON, Fla. — IBM's PC Xenix, the multiuser operating system for the Personal Computer AT, began shipment early this month, according to a company spokesman.

Developed by Microsoft Corp. for IBM, PC Xenix is based on AT&T's Unix System III. The operating system will allow the enhanced model of the Personal Computer AT (with 20M-byte hard disk drive) to support three users. It is priced at \$395.

IBM also began offering the PC Xenix Software Development System for \$455 and the PC Xenix Text Formatting System for \$145.

Originally announced at the AT's debut last August, PC Xenix is said to take advantage of the capabilities offered by the AT's Intel Corp. 80286 chip, including built-in memory management and protection and the ability for individual programs to use up to 8M bytes of memory.

IBM Entry Systems Division is headquartered in Boca Raton, Fla. 33432.

■ Microsoft Corp. has released an enhancement of its Macro Assembler that supports Intel Corp. 80186, 80286, 80287 instruction sets/**70**

■ Hewlett-Packard Co. has offered Multimate International, Inc.'s Multimate word processing package for the HP Touchscreen Personal Computer/**70**

■ Two graphics tablets and a mouse have been introduced by Summagraphics Corp./**70**

■ Mountain Computer, Inc. has announced hard disk drives for the IBM Personal Computer AT/**72**

INSIDE

Software/**72**

Can Apple pierce IBM mart?



SMALL TALK
Eric Bender

Microcomputer market strategists are now faced with a frightening question: Has IBM locked up the business market?

It is an important question not only for vendors but for users who worry about innovation.

When the micro market first formed

Caswell is a principal with Trigon Systems Group of Toronto and the editor of the "Electronic Mail & Micro Systems" newsletter.

in the early 1980s, most strategists envisioned a dynamic, multivendor market that no single company would be able to dominate. The underlying theory was that as technology is diffused throughout a society, it becomes impossible for any single vendor to gain control of the market.

The IBM Personal Computer, however, has now become the dominant force in the business micro market. Virtually every micro hardware vendor, except Apple Computer, Inc., AT&T and a few smaller firms in niche markets, has knuckled under to the requirement that it provide IBM-compatible hardware.

Many firms will have to worry about surviving the IBM onslaught. This article is the first in a series that will

See **BATTLE** page 76

Utility program gets users' OK

Lets PC-DOS programs run under AT&T Unix

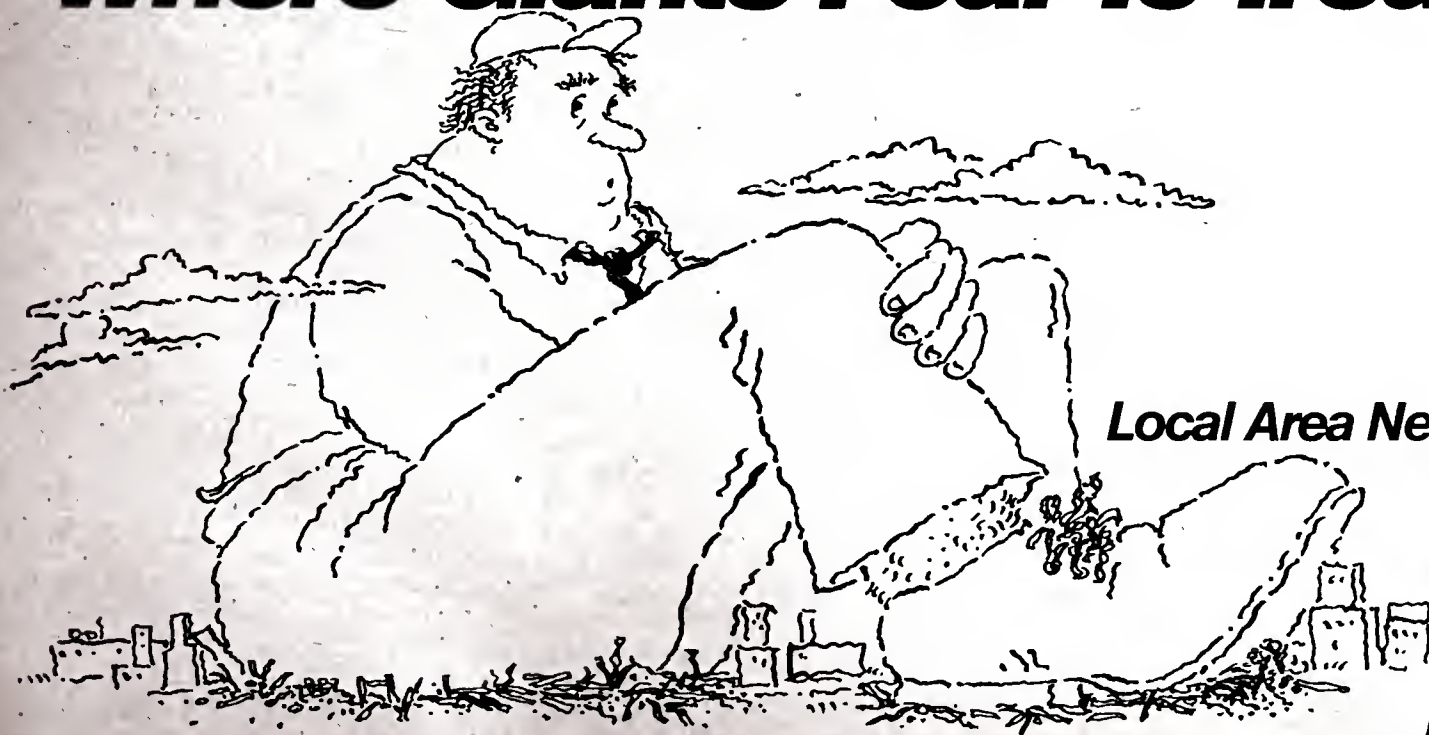
By Edward Warner
CW Staff

LITTLE ROCK, Ark. — Two early users of a personal computer utility program that allows IBM PC-DOS applications to run under AT&T's Unix said they are pleased with the software, although one has doubts about how widespread its use will become.

The Connector, offered by Uniform Software Systems, Inc. of Santa Monica, Calif., reportedly runs PC-DOS as a Unix task and permits Unix tasks to run in the background while a PC-DOS application executes in the

See **USERS** page 78

Where Giants Fear To Tread



Local Area Networks For Large Institutions

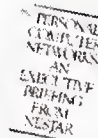
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For five years NESTAR has ventured where giants have feared to tread—local area networking. In fact, NESTAR has installed more large local area networks in large institutions than any other manufacturer.

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MICROCOMPUTERS

Microsoft enhances Macro Assembler

Version supports Intel 80186, 80286, 80287 instruction sets

BELLEVUE, Wash. — Microsoft Corp. has released a version of its Macro Assembler that supports Intel Corp. 80186, 80286 and 80287 instruction sets.

Macro Assembler includes an object linker, a library manager, a cross-reference utility, a program maintenance utility and a symbolic debug utility that allows programmers to examine and step through source code as well as object code, the vendor said.

As with previous versions, Macro Assembler reportedly features the ability to define and use macros, the capability to call other routines writ-

ten in other Microsoft languages and a conditional assembly capability that allows programmers to create and test different versions of a program.

Breakpoints for numbers, symbols

The symbolic debug utility is said to display source code lines in Fortran, Pascal, C and machine language.

It reportedly allows programmers to set breakpoints for numbers and symbols.

Programmers reportedly can single-step through a program following its execution at assembly level or

source level.

On-line Help is included, the vendor said.

The assembler offers Microsoft's program maintenance utility Make, which automatically updates a program after one or more source files have been changed, according to the vendor.

Macro Assembler runs under Microsoft's MS-DOS 2.0 and requires 128K bytes of random-access memory and a single disk drive.

Macro Assembler costs \$150.

Microsoft can be reached through Box 97200, 10700 Northup Way, Bellevue, Wash. 98009.

Graphics firm offers mouse, two tablets

FAIRFIELD, Conn. — Two graphics tablets and a mouse have been introduced by Summagraphics Corp.

The Mactablet, a 6-in. by 9-in. graphics tablet for the Apple Computer, Inc. Macintosh, reportedly allows users to trace and enter existing drawings. Drawings can be traced from a single sheet of paper or from originals up to 1/2-in. thick, such as magazines or notebooks, according to the vendor.

Summasketch, a 12-in. by 12-in. tablet, is said to offer the same features as Mactablet but in conjunction with computer graphics programs on the IBM Personal Computer, PCjr and compatibles.

Both tablets can be located alongside the personal computer's keyboard and offer a tilt mechanism for adjustment to user needs, Summagraphics said.

The Summamouse optical mouse is available in two versions. One version reportedly is compatible with IBM's Topview and Digital Research, Inc.'s operating environments. Another version is compatible with several Personal Computer computer-aided design software packages, the vendor said.

Mactablet is priced at \$495, Summasketch costs \$795 and Summamouse in either version is priced at \$199.

Summagraphics is located at 777 State St. Ext., Fairfield, Conn. 06430.

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HP releases Multimate tool for its micro

PALO ALTO, Calif. — Hewlett-Packard Co. has announced a version of Multimate. International, Inc.'s Multimate word processing program for HP's Touchscreen Personal Computer.

Multimate mimics commands used on Wang Laboratories, Inc. word processors. The word processing software features a spelling checker with an 80,000-word dictionary and room for 5,000 user-defined words, the vendor said.

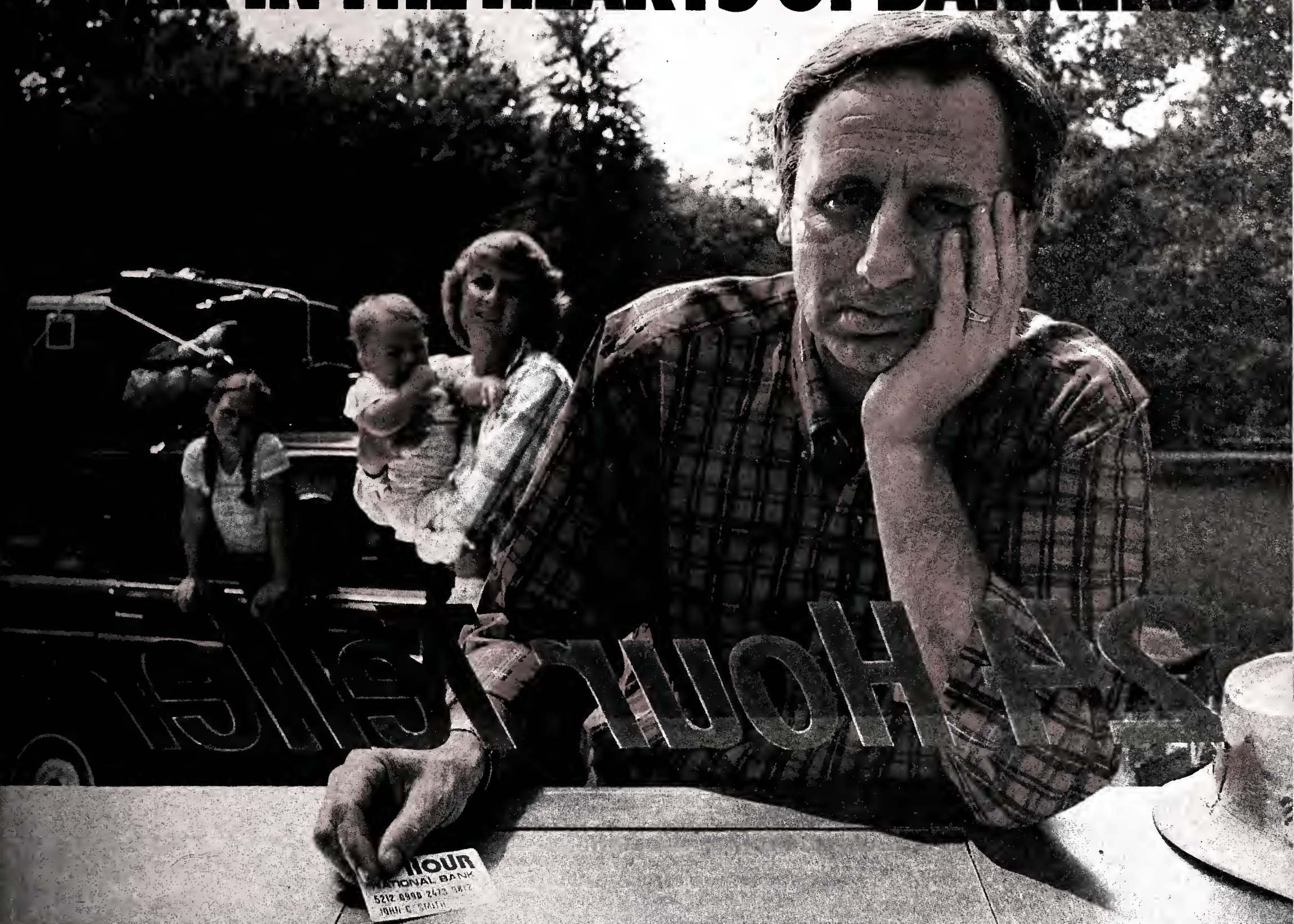
The software reportedly is able to merge two documents into one document. Page headings and footnotes can automatically be placed on each page, the vendor said.

The package supports addition and subtraction of columns of figures in a document, according to the vendor. In Insert or Delete mode, the product is said to automatically readjust text for proper spacing and positioning.

The package requires 384K bytes of random-access memory and costs \$495.

Information about the product can be obtained from Inquiries Manager, HP, 1020 N.E. Circle Blvd., Corvallis, Ore. 97330.

FOUR LITTLE WORDS THAT STRIKE FEAR IN THE HEARTS OF BANKERS.



"The computer is down."

It is ironic that when we become dependent on computers, we are at their mercy. As more and more companies go on line, the industry reliability standard of 98.5% becomes unacceptable because it means your computer is liable to go down once every two weeks, on a statistical average.

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RELATIVE PERFORMANCE*	125	100	64	109
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PRICE PERFORMANCE	\$ 3,571	\$ 7,079	\$ 6,840	\$ 5,999

Relative Price Performance Index

*Computerworld, August 20, 1984

All systems are comparably configured with identical amounts of memory, disk space, and communication lines. But, only the Stratus price includes fault tolerance.

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efficiency and security of fault tolerance, and the fact that it is the world's most powerful fault tolerant transaction processing computer, Stratus truly becomes impossible to ignore. In the 1980's Stratus simply is the right computer, at the right price. For information, contact your local Stratus sales office, or call Keith Johnson in Massachusetts at (617) 460-2188, or toll-free at 1-800-752-4826.

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MICROCOMPUTERS

SOFTWARE

**WALKER RICHER & QUINN, INC.
PC 2622**

Walker Richer & Quinn, Inc. has introduced its PC 2622 workstation management software for the Data General Corp. DG/One personal computer.

PC 2622 reportedly enhances the DG/One's terminal attributes by providing forms cache, type-ahead capability, hundreds of pages of display memory and the ability to scroll horizontally.

PC 2622 also is said to offer a command language and to allow unattended transfer of multiple files, host initiated processes and execution of commands upon expiration of a time period or recognition of a string transmitted from the host.

PC 2622 is priced at \$395, the vendor said.

Walker Richer & Quinn, Lake Union Place, Suite 201, 1914 N. 34th St., Seattle, Wash. 98103.

**COMMAND SOFTWARE SYSTEMS, INC.
Menucommand**

Command Software Systems, Inc. has introduced Menucommand software for the creation and maintenance of menus on IBM Personal Computers and compatibles.

Menucommand provides a series of menus and screen prompts to users, Command Software said. Users reportedly can define each menu selection's title, the program or procedure file that it will run and the device or subdirectory path on which the program resides.

Menucommand also is said to provide system security by returning users to the "calling" Menucommand menu, not the operating system, when they exit a program. Menucommand is priced at \$89.50.

Command Software Systems, 5308 Derry Road, No. K, Agoura Hills, Calif. 91301.

**BUSINESS MANAGEMENT SYSTEMS, INC.
Mshell**

Business Management Sys-

tems, Inc. has introduced Mshell, a custom menu, security and user-assistance system for AT&T Unix-based software on the IBM Personal Computer and Personal Computer AT.

Mshell reportedly provides new Unix users with a menu — a selection of the most frequently used Unix operating commands. Commands are said to be fully prompted, eliminating the need to memorize character

Continued on page 73

Disk drives out for IBM micro

SCOTTS VALLEY, Calif. — Mountain Computer, Inc. has introduced three hard disk drives for the IBM Personal Computer AT.

The hard disk drives, offering 20M bytes, 35M bytes or 120M bytes of storage, reportedly can be installed in as little as 10 minutes. The hard disk drives are intended to meet the need for en-

hanced Personal Computer ATs (with a 20M-byte hard disk), currently said to be in short supply, according to Mountain Computer.

According to the vendor, the disks use the standard Personal Computer AT's disk controller and the Personal Computer AT's power supply.

The disks can be installed

in the second diskette drive position, a spokesman for Mountain Computer said.

The hard disk drives are priced as follows: 20M bytes, \$1,995; 35M bytes, \$2,795; and 120M bytes, \$9,590.

More information is available from Mountain Computer, located at 300 El Pueblo Road, Scotts Valley, Calif. 95066.

Getting a group of five or six personal computers networked isn't that big a deal. But it gets complicated when the group gets bigger. And in case you hadn't noticed, the groups are getting bigger. Fast.

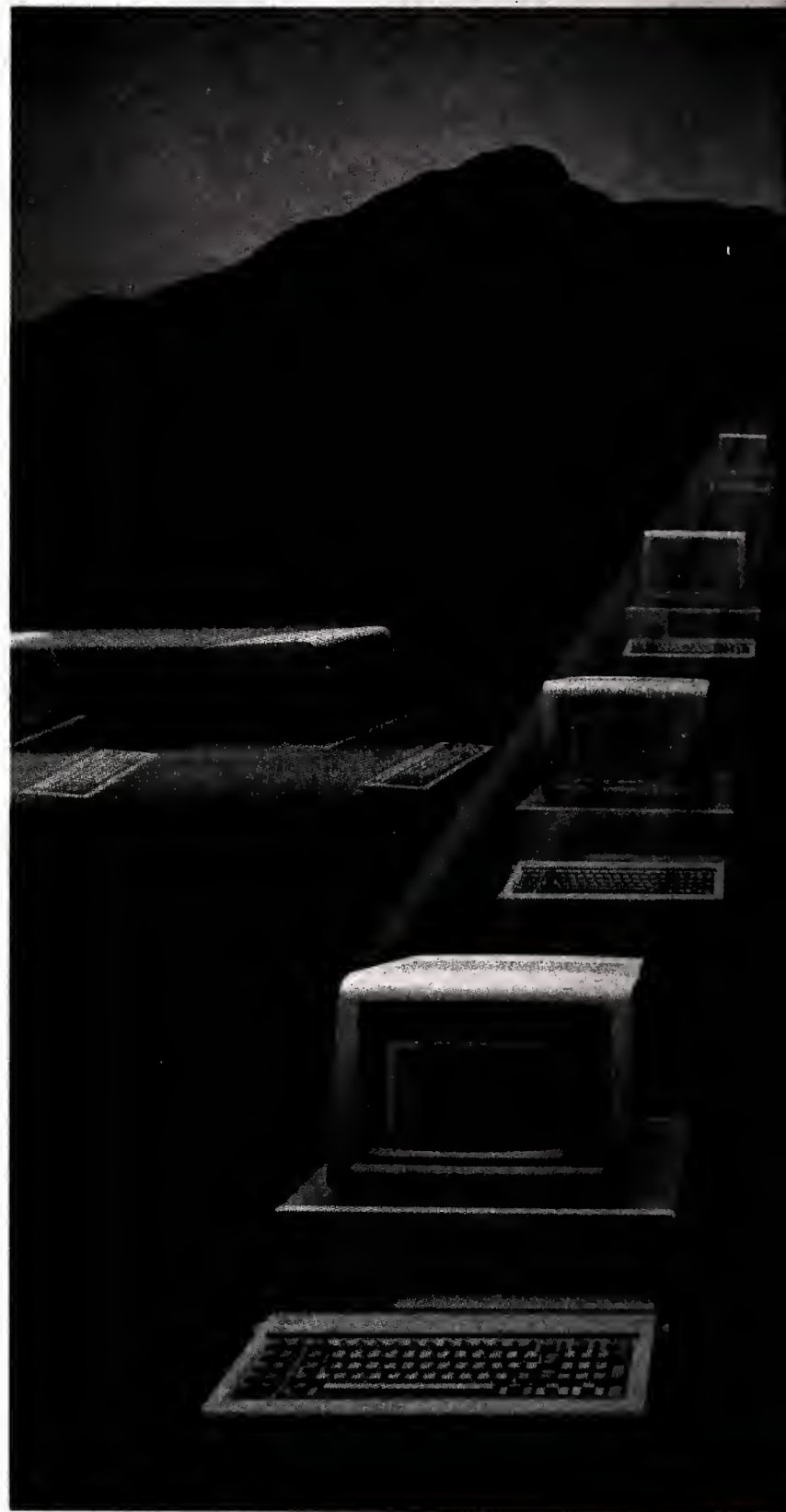
Experience may have already taught you that low-end PC networks run out of steam in a hurry once you have more than five or six stations connected. If your plans include several PCs or several hundred, high performance isn't a luxury. It's critical.

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It's a far-sighted solution, even if all you want to do now is hook up a few PCs economically. And it's the *only* solution when PCs need to be mixed cost effectively into a high-speed corporate network with devices from different manufacturers.



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MICROCOMPUTERS

Continued from page 72

sequences. It can be used to design a custom menu interface and to control access to applications and system options.

Mshell is priced at \$125.

Business Management Systems, 9526-A Lee Highway, Fairfax, Va. 22031.

INTELLUTION, INC. Fix

Intellution, Inc. has announced Fix, a process con-

trol package designed for use with the IBM Personal Computer.

Intellution's Fix interactive graphics display builder features 128 process control symbols. In addition, it offers cut-and-paste capabilities, according to vendor.

According to Intellution, process values and statuses can be displayed as text strings, bar graphs, color changes and flashing.

Fix features multitasking capabilities, allowing it to

run in foreground or background with packages such as Micropro International Corp.'s Wordstar, according to a spokesman for the vendor.

Fix costs \$4,000, the vendor said.

Intellution, 35 Perwal St., Westwood, Mass. 02090.

POLYGON SOFTWARE CORP.

Easypath

Polygon Software Corp.

has introduced Easypath software for the creation of subdirectories without copying files back and forth. The software is reportedly designed for use with systems in the IBM Personal Computer line.

Easypath reportedly allows programs and commands to find any files on any of the computer's disk drives.

The Easypath software package reportedly permits search paths to be specified

separately for particular files or particular groups of files, a spokesman for Polygon said.

Easypath also is said to come with predefined specifications for Ashton-Tate's Dbase II, Micropro International Corp.'s Wordstar and other programs.

Easypath is priced at \$100, according to Polygon.

Polygon Software, 363 Seventh Ave., New York, N.Y. 10001.

See **TOOLS** page 74



HERE'S A CASE WHERE A BIGGER ENGINE IS ACTUALLY MORE ECONOMICAL.

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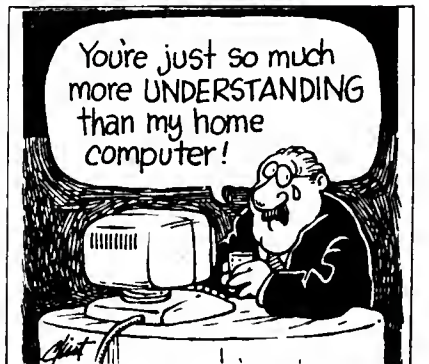
DISK from page 69

Larson admitted that PC-DOS requires from two to three times more error-free space at the start of the 20M-byte disk drive on the AT than it did on the XT, but said that the AT's hard disk drive should meet that requirement without a problem. That error-free space is used to establish the partitions on the hard disk drive for use under each possible operating system, he said.

Setting the partitions can bring up the "Format Failure" response, he said, because too little error-free space is available for the information. To overcome this, users will need to execute DOS commands to repartition the disk and reformat it, a process explained in PC-DOS documentation, he said.

Release 3.1 of PC-DOS will solve only the disk drive reliability problems that are apparent at the time of start-up, Larson pointed out. If a faulty data sector should appear in later use, reformatting the disk drive will be required — along with complete backup to avoid loss of data.

PC-DOS, Larson said, was not designed to recognize faulty data sectors that appear after the disk drive has been put into use. At that point, he said, a utility such as Dfixer, recently introduced by Interactive Data Corp. of Cambridge, Mass., would be useful.



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(312) 986-9116

MICROCOMPUTERS

TOOLS from page 73**SOUTHWEST DATA SYSTEMS, INC.**
Pluto

Southwest Data Systems, Inc. has introduced Pluto, a Basic language interpreter and programming environment for systems running Microsoft Corp.'s MS-DOS and Digital Research, Inc.'s CP/M operating systems.

Pluto reportedly offers

portability and runs with MAI/Basic Four Business Basic and Science Management Corp. SMC Basic languages. It permits Basic Four programs to run under either operating system without being rewritten, the vendor said.

Pluto reportedly offers multiple user capabilities as well as record and file locking; indexed, direct, sort and host system serial text files; and math functions.

It is priced at \$595.

Southwest Data Systems,

3017 San Fernando Blvd.,
Burbank, Calif. 91504.

PRACTICORP INTERNATIONAL, INC.
Practibase

Practicorp International, Inc. has announced Practibase, a data base management program for the IBM Personal Computer line.

Practibase can handle up to 254 char./field, 60 fields per record, 2,000 char./record and an unlimited num-

ber of records per file, the vendor said.

The program reportedly can access three files at one time and can simultaneously sort or index any number of files.

It reads Ashton-Tate's Dbase II files and runs Dbase II programs, according to the vendor.

Practibase costs \$99.95.

Practicorp International,
The Silk Mill, 44 Oak St.,
Newton Upper Falls, Mass.
02164.

GENERAL DATA SECURITY SYSTEMS, INC.**Computer Intelligence Access**

General Data Security Systems, Inc. has introduced its Computer Intelligence Access (CIA) software security system for the IBM Personal Computer XT.

CIA reportedly offers multilevel password access, automatic audit capability and an algorithm encryption scheme derived from the U.S. government's Data Encryption Standard.

The product also includes a protection system that prevents users from erasing or deleting files and offers an updated inventory list of all files, according to General Data.

CIA requires 256K of internal memory and a hard disk drive and is priced at \$300.

General Data Security Systems, 1127 Loma Ave.,
Long Beach, Calif. 90804.

STRATEGIC LOCATIONS PLANNING
Atlas AMP

Strategic Locations Planning has introduced its Atlas Advanced Mapping Package (AMP) for the IBM Personal Computer line.

Atlas AMP reportedly can create maps of states, census tracts, counties and other regions. It can shade areas based on user-defined criteria such as sales or population, according to Strategic Locations.

The package also is said to label regions and provide zooms and dot-density mapping.

The software, which resides in 192K bytes of storage, is priced at \$449.

Strategic Locations Planning, Suite 123, 4030 Moorpark Ave., San Jose, Calif. 95117.

MICRO BUSINESS APPLICATIONS, INC.
MBA Job Cost

Micro Business Applications, Inc. has introduced MBA Job Cost software for the following operating systems: Digital Research, Inc.'s CP/M 80, CP/M 86, Concurrent CP/M 86 and MP/M II; Musys Corp.'s Turbodos; IBM's PC-DOS; and Microsoft Corp.'s MS-DOS.

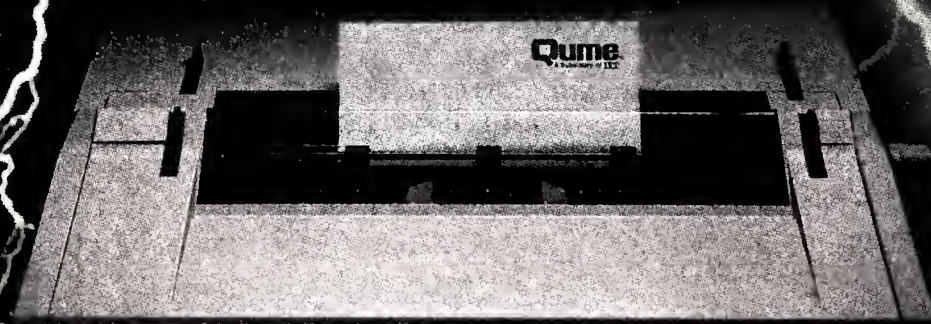
The Job Cost system allows job-phase structure with user-definable overhead allocation, according to the vendor.

Job Cost also permits estimated costs in both units and dollars to be maintained by the system, with automated projections of the final cost, the vendor said.

MBA Job Cost software is priced at \$595.

Micro Business Applications, 12281 Nicolle Ave. S.,
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A black and white photograph showing a close-up of a hand adjusting a tuning peg on the head of a violin. The violin's body, f-hole, and strings are visible, extending from the bottom left towards the top right of the frame. The background is a plain, light color.

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MICROCOMPUTERS

BATTLE from page 69

examine key microcomputer vendors and their strategies.

Apple is the only firm left that has yet to succumb to the market's demand for IBM compatibility. Apple has its highly successful Apple II line that has built up an almost unstoppable momentum at the low end of the market for home, school and light business users but is not now considered a serious business machine.

Instead, Apple is resting its hopes for penetrating the business market on the Macintosh. The Macintosh has sold very well during its first year on the market, coming close to the 250,000 mark. Nevertheless, many users do not consider the Macintosh a serious business machine, citing the lack of software and the memory

size of 128K bytes as major limitations.

Apple already has gone a long way toward opening up the Macintosh to better business software by introducing the "Fat Mac," which uses 256K-bit random-access memory chips to expand memory to 512K bytes. This opens the door to powerful business software that can show off the Macintosh's easy-to-use interface.

"

While the Macintosh may not take over the Personal Computer's place, there is certainly a role for it in the office automation marketplace if Apple Computer makes the right moves.

In addition, users must remember that the Macintosh is still in its first year. While Apple has caused some difficulties for itself by underestimating the difficulty of writing good Macintosh software and, in concert with the software vendors, preannouncing the availability of many packages, the Macintosh is still far ahead of where the IBM Personal Computer was during its first year.

Users also should keep in mind

that good Macintosh software is far easier to use than Personal Computer software, which should lower training and start-up costs. While the Macintosh may not take over the Personal Computer's place, there is certainly a role for it in office automation if Apple makes the right moves.

At its annual meeting this week, Apple plans to announce Mac Office, a series of products designed to turn the Macintosh into a viable business machine. The three key products are a laser printer, a local-area network and a file server.

The printer is based on the Canon LBP-CX engine used by Hewlett-Packard Co. in its Laserjet. The LBP-CX prints at eight page/min and is priced by HP at \$3,500.

HP uses cartridges to load a maximum of four fonts into the printer and only produces graphics of moderate quality.

Apple's version of the printer will download the fonts from the Macintosh, so that any font used on the machine can be printed with almost typeset quality. In addition, the graphics will be at least the same quality as those printed on the Macintosh's screen.

The big question about Apple's laser printer is its price. Because the print driver is far more complex than HP's, price estimates have ranged from \$5,000 to \$7,000. Recent rumblings, however, suggest either that the price has been overestimated or that Apple may lower the price, almost making the printer a loss leader.

So Apple might surprise everyone by pricing its printer to match or even beat the HP Laserjet. This would immediately make the Macintosh the most attractive micro available in terms of output. The Applebus local-area network also will surprise people. Most networks require an interface board priced from \$350 to \$650 just to interconnect the micro to the network.

The Macintosh, however, has RS-422 serial interfaces already built in, so Apple's network will not require an interface card. Connections, made via a junction box that plugs into a hard-disk-based file server, will be priced at about \$50.

Trade-off is speed

The trade-off is speed. The network will only operate at about 240K bit/sec, which limits the number of users it can support. Apple, however, believes that the typical configuration of Applebus will be in small departments of from five to 15 people. The network's maximum capacity is said to be 32 connections.

The third part of Apple's strategy is a file server. Little is known about this device, but it is likely that the file server could turn out to be the real gem. The server may make Applebus the easiest to use network on the market, if it fully supports the Macintosh's interface.

When users access programs or store documents on the Macintosh, they see a representation of the disk as an icon on the screen. To access a file, the user merely clicks the mouse twice and the files on the disk open up. To run a program or access a file, the user then clicks twice on the file/program icon.

The file server probably will use this convention, so that its operation will be transparent to users. The

See **BATTLE** page 78



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MICROCOMPUTERS

BATTLE from page 76

server will be seen as just another disk on the system, accessed as a local disk.

Printing will occur in the same way. Users will see a printer menu on the screen, which probably will be upgraded to offer a choice of the network's laser printer or the local Imagewriter printer. Users will just click to select the printer.

Apple also may make some other moves, including network gateways that allow Macintoshes to emulate Ascii or IBM terminals. In fact, Apple might even allow IBM Personal Computers to be connected to its file server. But these offerings would be icing on the cake.

While Apple is paving the way to a more powerful business environment for the Macintosh, it is likely that the software developers will provide further impetus via a wave of good software designed for the 512K-byte Macintosh that will hit the streets during the next few months. Lotus Development Corp.'s Jazz will be the most heralded product, but word processing, accounting, data base management and desktop products also will be introduced.

The word processing, accounting and data base management packages will provide parity with the IBM Personal Computer. The desktop packages, however, will give the Macintosh an advantage.

The Macintosh has space set aside for desktop accessories that can run concurrently with an application program. With a 512K-byte Macintosh, users will be able to keep a Rolodex, a list of phone numbers, a

terminal emulator, a scratch pad and a calendar inside the machine without giving up sufficient memory space for application programs. The accessories can be loaded in the morning, updated throughout the day and then saved at night. The impact will be to turn the Macintosh into an integrated voice/data workstation without requiring an

expensive add-on package or card.

While the Macintosh is presently suspect as a business machine, the technology is fundamentally far ahead of the IBM Personal Computer. If Apple and the software developers deliver, the Macintosh could well be far ahead of today's IBM Personal Computer as an attractive business machine by the middle of 1985.

”

Apple might surprise everyone by pricing its printer to match or beat the HP Laserjet. This would immediately make the Macintosh the most attractive micro available in terms of output.

USERS from page 69

foreground.

Samuel M. Reynolds, of Savers Federal Savings and Loan Association here, said the utility was easy to install, came with appropriate documentation and operates transparently to users. Savers Federal is using the Connector on an experimental basis for software development for the IBM Personal Computer, he said.

Reynolds, the firm's distributed data processing manager, said he liked the way the program allowed users to toggle back and forth between IBM's PC-IX Unix-derivative operating system and PC-DOS or PC-DOS applications. He also approved of its ability to import data from PC-IX programs to PC-DOS applications.

The product is currently in use only on one IBM Personal Computer XT at Savers Federal, and Reynolds said his firm is unlikely to provide the Connector to its end users. "I don't see the Connector as being a product that has a real long-term use," he said. "Most likely, people will use one operating system." That operating system, he added, is likely to be MS-DOS.

'Low-level' problems

In addition, Reynolds said he found some "relatively low-level" problems in using the Connector with Version 3.0 of PC-DOS. "Some fairly substantial differences in system calls" between PC-DOS 3.0 and the 2.0 and 2.1 versions of PC-DOS have limited his firm's use of the Connector with the earlier releases of that

operating system, he said.

Reynolds added that he had no problem running software written for the earlier versions of PC-DOS. Peter Weiner, founder of Uniform Software Systems, said the Connector works with "a long list" of PC-DOS programs.

Another early user expressed no hesitations about the Connector. Sophocles Orfanidis, a professor of electrical engineering at Rutgers University in Piscataway, N.J., said he uses the Connector to gain more efficient use of his Personal Computer XT. While running a statistical analysis program written in the C language that takes half an hour to execute in the background on the Personal Computer, Orfanidis uses the machine's foreground to execute PC-DOS applications.

"While the C programs are running, I go into PC-DOS to plot available data," he explained. "I'm not wasting my time while the computer is running my computations." Orfanidis, though, said he is using the Connector solely for personal use and not as part of a Rutgers' preimplementation test.

Both Reynolds and Orfanidis said they were largely pleased with the Connector. As Reynolds put it, "You can dip your toe into the Unix environment without having to plunge all the way in."

The Connector is priced at \$299. Versions for Venturcom, Inc.'s Venix and Microsoft, Corp.'s Xenix operating systems, both Unix derivatives, are under development, said a Uniform Software Systems spokesman.

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COMPUTER INDUSTRY

DOD export review OKed

Reagan approves Pentagon's review of licenses for exports to 15 non-Communist countries

By Bryan Wilkins
CW Washington Bureau

WASHINGTON, D.C. — President Reagan has settled a dispute over Pentagon review of high-technology export licenses that has been stalemated since last year by giving the U.S. Department of Defense (DOD) a limited role to look at shipments destined for 15 non-Communist countries.

The U.S. Department of Commerce had vigorously fought any role for the Defense Department, citing its power under the Export Control Act, which Congress failed to renew last year but which continues in force by Reagan's order.

Reagan's order, issued Jan. 11, states that the DOD has 15 days to review an export license request and can recommend approval or denial. Unless serious objections are raised by the shipment of high-technology products, the license will be

approved.

Three weeks ago, the Commerce Department issued revised guidelines that define the technical parameters of computers, telecommunications equipment and software that will require an export license [CW, Jan. 14]. These rules are generally loosened for lower end, 8-bit computer technology but tighten up considerably on other commercially available products such as 16-bit computers.

Reagan's latest directive creates ground rules to resolve disputes between the DOD and Commerce Department, which have raged in the past year. A year ago a presidential directive to establish guidelines was never implemented because of agency disagreements. Now the National Security Council will have power to settle disputes.

The Reagan order limits the number of

See DOD page 92

Motorola exec: Chip industry 'a drag' in '85

By David Olmos
CW Staff

BURLINGTON, Mass. — Echoing the gloomy sentiments heard throughout the semiconductor industry, a Motorola, Inc. executive said the company is forecasting a "not so aggressive" 1985.

Keith J. Bane, a vice-president and director of strategy for Motorola, said earlier sales forecasts by the company had been more optimistic. However, recent developments in the industry and the U.S. economy have caused the company to revise those estimates downward.

"Whether we have an [economic] recession or not, 1985 will be — as the kids say — a drag," Bane said at a recent meeting here of the Semiconductor Equipment and Materials Institute, a Palo Alto, Calif., industry association.

Describing how the industry has gone from "boom to bust" in the past six months, Bane said Motorola's order backlogs have "fallen dramatically" from their record highs several months ago when the company experienced 10-month backlogs. The company's so-called book-to-bill ratio has hovered around 0.50 in recent months, he said, which means the company took in 50 cents worth of new orders for every \$1 of product shipped out.

The Semiconductor Industry Association recently reported that the book-to-bill ratio had reached its lowest point ever — 0.58 — in December.

Motorola is predicting a 10% growth in sales in 1985, which compares with an average growth rate of about 17% during the past five to six years, according to Bane.

Bane said part of the blame for the industry slump must be placed on the chip makers themselves for their failure to understand their customers' inventory needs better. Semiconductor vendors have been hurt in recent months by significant order cancellations and rescheduling of pur-

See SLUMP page 89

■ A semiconductor trade association said the industry may have stabilized, but projected a low growth rate for this year. Meanwhile, Intel Corp.'s fourth-quarter profits dropped sharply from the year-earlier level/89

■ Storage Technology Corp. announced last week that company founder Jesse Aweida had resigned as chairman of the financially troubled company, which is currently operating under protection of Chapter 11 of the Federal Bankruptcy Act/90

■ Martin Marietta Data Systems acquired Oxford Software, Inc. and said it now ranks among the top five independent software vendors/94

Ely cites HP regrouping among factors of move to new company

By Kathleen Burton
CW West Coast Bureau

SANTA CLARA, Calif. — A reorganization last July that removed him from a key position as overseer of Hewlett-Packard Co.'s computer operations was just one factor that led Paul C. Ely Jr. to his new position as president of Convergent Technologies, Inc.

But, despite rumors that being bypassed for HP's chief operating officer post by longtime coworker Dean O. Morton played a major part in his decision to leave HP after 22 years, Ely said Morton was "the right choice" to become chief operating officer of the firm.

Ely had been with HP since 1962 and has been credited with building the company's

computer product line over 10 years into a solid business, representing over half of HP's \$6 billion revenue, before accepting the job as the new president and chief executive officer of Convergent Technologies [CW, Jan. 14], a Santa Clara-based manufacturer of computer workstations and minicomputers.

In an interview the day after his appointment, Ely said several events contributed to his decision to leave HP. Considered by some to be the heir apparent to John A. Young, HP president and chief executive officer, Ely was passed over for the new post as the company's chief operating officer by Morton, who had been HP's executive vice-president for analyti-

See ELY page 80

Chip mart outlook not so rosy



INDUSTRY INSIGHT

Peter Bartolik
CW Senior Editor

Wall Street let out a sigh of relief a couple of weeks ago, apparently convinced that the semiconductor industry has weathered the worst of the storm in the eroding market for semiconductors.

The optimists who bid up the stock on leading semiconductor vendors may have to do some reevaluating when the realities of the situation set in, however.

A recognized facet of the peculiar chip industry is that systems integrators tend to double order in times of scarce availability, only to cancel

excess orders later, when the industry enters a downturn, thus creating a crisis-like atmosphere as order rates plummet.

Now the industry and analysts are telling investors that the correction to overbooking has been accomplished. So investors perked up.

Note well, however, that chip vendors themselves have not perked up; National Semiconductor Corp. announced a two-week shutdown for February [CW, Jan. 14] and held out the possibility of a similar shutdown this spring.

Note also that the Semiconductor Industry Association predicted only a 2% to 5% growth in semiconductor sales for this year and pegged that on the assumption that second-half demand will pick up greatly from the

See MART page 92

Franklin aims to stay in business, banks on Apple-compatible micro

By Peter Bartolik
CW Staff

PENNSAUKEN, N.J. — Franklin Computer Corp., scrapping its former plan to liquidate its assets and go out of business, said recently it will try to emerge from bankruptcy proceedings and continue to manufacture microcomputers that are compatible with Apple Computer, Inc.'s Apple II line.

After agreeing in January 1984 to pay Apple \$2.5 million for infringing on Apple operating software copyrights, Franklin suffered a number of setbacks that forced it to file for protection last summer under Chapter 11 of the Federal Bankruptcy Act [CW, July 2]. Later in the year, Franklin said it had decided to liquidate its assets and turn over the proceeds to creditors [CW, Nov. 12]. At

that time, it had liabilities of \$22.8 million and reported that assets of \$33.9 million had been written down to \$15 million.

But the company filed an amended reorganization plan earlier this month seeking court approval to pay off creditors with a package offering less than 25 cents for every dollar owed in addition to stock that would give the creditors a 16% stake in the company. The plan has been ap-

See FRANKLIN page 95

Gavilan Computer Corp. gave up the ghost while Osborne Computer Corp. exited Chapter 11 and Eagle Computer, Inc. converted much of its debt into equity. See pages 94-95.

COMPUTER INDUSTRY

Former HP exec expected to revitalize Convergent

By Kathleen Burton
CW West Coast Bureau

SANTA CLARA, Calif. — The day after a new president was appointed to lead the company he founded, Allen H. Michels, chairman of Convergent Technologies, Inc., described himself as an entrepreneurial sprinter who needed a high-quality, long-distance runner to keep his firm on track for the next decade.

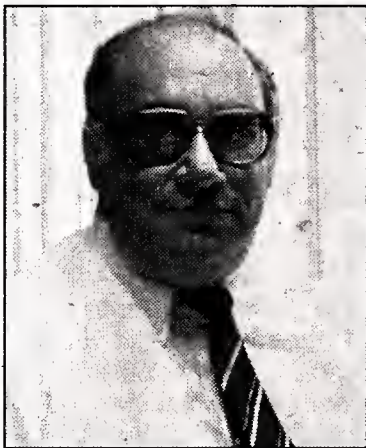
"I've made a lot of mistakes running this company in the past, and I'd probably do many of them again," Michels admitted. "I'm basically a risk-taker and always will be; you can only grow if you take risks."

Veteran Hewlett-Packard Co. executive Paul C. Ely Jr. was named

president and chief executive officer of Convergent Technologies.

Michels described Ely as "basically very tough, and we value that characteristic here." According to Michels, "a marriage between two executives is like any marriage; two people have to work at it over time to make it successful."

Michels disputed industry and Wall Street perceptions that the company's poor showing during the last two quarters and its ballooning accounts receiv-



Michels

able and inventory have caused severe financial difficulties. Cash flow is not a problem, he asserted, claiming the company can draw on a \$70 million line of credit and \$1.7 billion in back orders that could carry Convergent Technologies through 1986. Currently, Convergent Technologies plans to balance finances by reducing accounts receivable and inventory and operating with reduced assets, he said.

Michels said new management was

needed because "with our phenomenal growth rate, we'd been trying to do too much too fast."

Michels predicted Ely will manage Convergent Technologies to the \$1 billion annual revenues level. Convergent Technologies is a five-year-old company that shipped its first system in 1981. Last year, the company posted approximately \$400 million in sales.

The problems that plagued the company last year have been corrected, Michels said. In 1984, Ngen, Convergent Technologies' flagship product that accounts for approximately 65% of corporate revenues, was plagued with technical setbacks, higher-than-expected production costs and parts shortages that delayed production and ate into profit margins. Many consider Convergent Technologies' biggest mistake in 1984 was the unsuccessful marketing of its own laptop computer.

Among the company's strengths, Michels said, is the soon-to-be-announced desktop computer produced for AT&T's Information Systems.

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CW

ELY from page 79

cal instruments and medical equipment. Ely said, however, that "Morton was the right choice to lead the company; the [chief operating officer] position is not where my talents lie."

At that time, Ely also was reassigned from computer operations to head the medical, components technology and analytical instruments groups and HP's corporate engineering and research and development groups. "It was a dramatic change for me," Ely admitted.

Ely said he began last fall to consider job offers seriously that had flooded in after the reorganization, and that age played a factor. HP has a policy of retiring officers at age 60; Ely is now 52. "I plan my life in 10-year cycles," he said, "and now seemed a good time to consider this issue."

David Crockett, vice-president of Dataquest, Inc. in San Jose, Calif., said that this is a good time for Convergent Technologies to bring in "a heavy hitter like Ely who excels in R&D, manufacturing and contract negotiations." According to Crockett, Convergent Technologies' weak position during the last two quarters was due to manufacturing problems, insufficient margins, high production costs causing cash-flow problems, along with introduction of the Workslate laptop computer that failed in the marketplace.

Ely's Jan. 6 departure triggered HP's second management reorganization since last July. Under the new organization, HP's medical, components, technology and analytical instruments group formerly headed by Ely has been restructured into the manufacturing, medical and analytical systems sector to be headed by Lewis Platt, an HP vice-president and general manager of the Manufacturing Systems Group. Ely's other major divisional responsibility, HP Laboratories, the company's central research arm, now reports directly to HP's Young, as had been the case prior to last July's companywide reorganization.

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COMPUTER INDUSTRY

Software remains ineligible to receive benefits of FSCs



OUTSIDE LINES
Alonzo D. Saunders

European and Japanese high-tech companies receive subsidies from their governments for exports. But the fact of the matter is that American companies receive subsidies as well. One source of subsidy is the Foreign Sales Corp. (FSC), which is the legal successor to the Domestic International Sales Corp. (Disc).

Congress replaced the Disc with the FSC because America's European and Japanese trading partners complained about it. They charged that the Disc gave American companies an unfair advantage in that it allowed them to sell overseas at a lower cost. Some years ago, the Europeans and the Japanese turned their criticism into a real threat to retaliate in kind — by imposing countervailing import duties on U.S. products exported by Discs.

FSCs differ from Discs in a number of ways. FSCs are now required

Saunders is a Boston-based attorney whose practice focuses on international marketing, antitrust and corporate finance.

to be real corporations, not paper ones. This means that FSCs must be incorporated and managed overseas; must keep books and records overseas; hold annual meetings of stockholders and meetings of directors overseas; have at least one director who is not resident in the U.S.; and, of course, they must derive their income from transactions and related advertising, promotion and administration overseas.

Whether this more or less minimal compliance with these treaties will really assuage our trading partners remains to be seen. But the position of the U.S. government is that it did what it had to do and is not going to do any more. The administration also points out that the requirement that FSCs be real corporations puts some money in the pockets of foreign lawyers, accountants, bankers and businessmen and allows foreign governments to tax these corporate entities.

The tax rate of the approved countries is an important factor now because no U.S. tax credit for the payment of foreign taxes is allowed. Countries such as Jamaica, the U.S. Virgin Islands and Ireland all now seem to be popular among the countries where FSCs are to be incorporated, the first two for reasons of climate, the third because of the ex-

See FSC page 85

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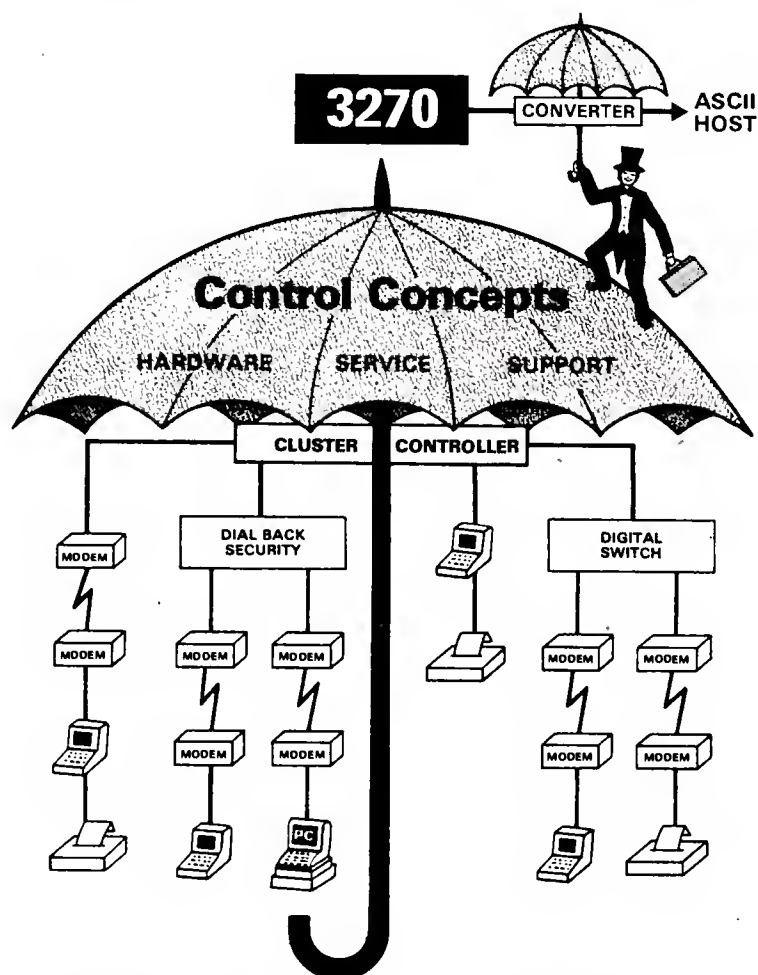
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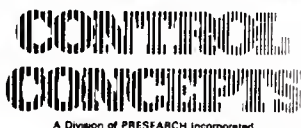


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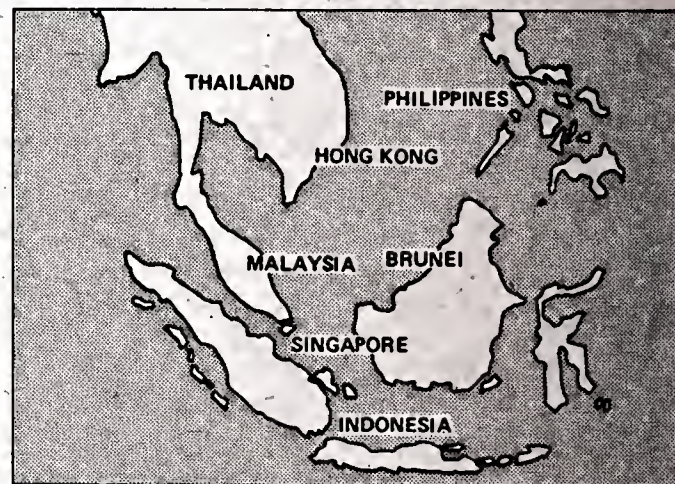


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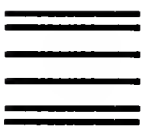
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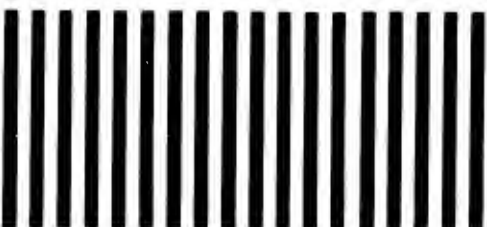
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COMPUTER INDUSTRY

FSC from page 84

tensive number of additional tax incentives already available to American companies. For companies exporting to the Far East, the Marianas and Guam are on the Treasury-approved list.

The following issue does not foretell good things for the high-tech industry. In the change from the Disc to the FSC, the tax regulations did not make any change to the types of products that were eligible for favored treatment. So-called intangible property, which includes trademarks, copyrights and patents, has never been eligible, and neither has software. They are not eligible now either. The works of Shakespeare, if reduced to a book and exported, receive favored treatment, while those same words, reduced to a disk and exported, are not favored. A strange anomaly indeed.

U.S. lawyers and accountants are considerably vexed by this anomaly. One Big-Eight accounting firm, Coopers & Lybrand, points out in its "Survey of Tax Issues Affecting Software Developers and Users" that software which is sold as well as software which is licensed "should be considered as tangible property and therefore qualify for [FSC] benefits. So long as [a] master tape used to make reproductions is manufactured in the U.S., it should be considered as tangible property [because] a master tape is significantly different from intangible assets [such as patents or copyrights] in that it represents a physical tangible asset." Furthermore, "the value of the computer program [is] dependent upon the existence of the physical asset. That is to say, the data recorded on the tape could not exist unless it was on the physical medium."

Treasury, IRS rules differ

There is another problem. The Treasury regulations state that "a license of a master recording tape for reproduction outside the U.S. is not disqualified from being export property." Yet in reality, the IRS ignores this letter of the law, so there is pressure to force the IRS to adhere to its own regulations.

To complicate matters further, the IRS does treat computer tapes and movies as tangibles for purposes of the investment tax credit, a domestic subsidy if you will, but the IRS did not agree to do so willingly. They had to be taken to court. In *Walt Disney v. U.S.*, Walt Disney claimed that the cost of movie film included the cost of making the film, that is, it included production costs and was not limited to the cost of raw film. And in another case, *Texas Instru-*

ments v. U.S., TI argued, also successfully, that tapes and films that had certain seismic data on them were tangible property for purposes of the investment tax credit.

So, argue the lawyers, why cannot software be considered to be in the same boat and therefore become tangible for export by an FSC.

Some companies are reportedly planning to run the risk and challenge the IRS, using the Walt Disney and TI cases as precedents.

As of this writing, no litigation has surfaced, but it should be only a matter of time until an IRS audit disqualifying software is challenged in court.

Of course, the government is not standing still either. The new Reagan tax proposals have not been fully digested with respect to FSCs, so there are many business leaders, and their lobbyists, who do not know whether the new proposals will render FSCs moot.

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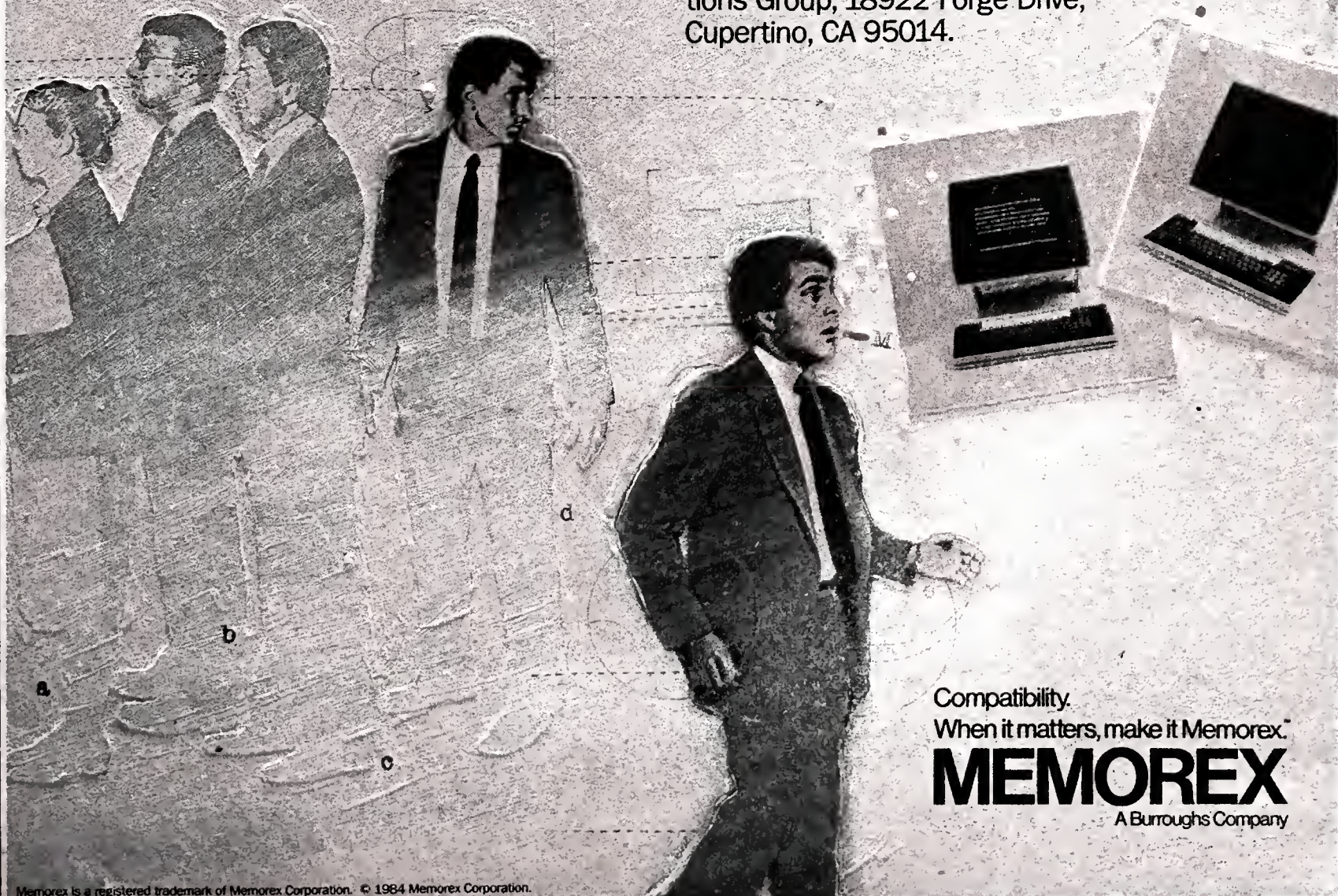
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COMPUTER INDUSTRY

SIA predicts weak growth for chip mart

SAN JOSE, Calif. — The Semiconductor Industry Association (SIA) said recently the decline in the semiconductor industry appears to have stabilized, but the association projected that the U.S. market will experience only 2% to 5% growth this year.

The SIA said new orders for the three-month period ended in December showed only a 4.3% drop from the September-to-November time frame, reflecting a traditional increase in December shipments. The association's book-to-bill ratio, comparing new orders with shipped orders, was 0.58 in December.

SIA President Thomas D. Hinkelman said the industry situation in December indicated that a period of "massive" order cancellations and reschedules by customers of semiconductor vendors has ended. But he added that the semiconductor business continues to be weak.

"The industry's 1985 performance will be significantly affected by current inventory levels, a slower real rate of growth in semiconductor use and price attrition," Hinkelman said. "We estimate the U.S. market will grow between 2% and 5% in 1985 to not more than \$12.2 billion. This scenario assumes a steep rise in demand from the first half to the second half of 1985."

SLUMP from page 79

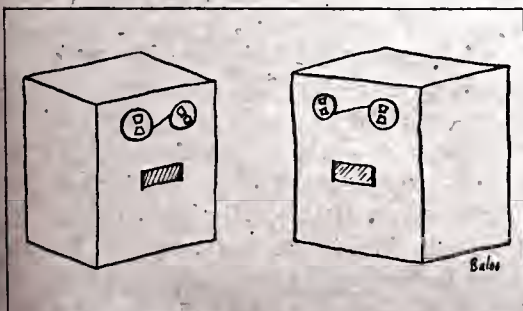
chases by their customers.

Chip manufacturers have "no way of knowing" which orders are legitimate, necessitating increased production capacity, and which ones are simply "security" orders by customers to cover a need for parts that later may not materialize, according to Bane.

"We need to get closer to our customers and to understand more about the security games played by purchasing agents and companies," he said.

Bane said that as the chip industry has grown larger, it has become increasingly affected by the cyclical nature of the world economy and the fortunes of an ever-broadening base of customers.

"The [semiconductor] industry is more pervasive than it was in the past," Bane said. "In earlier years, we supplied primarily consumer markets or market niches, but the industry now has achieved a level of pervasiveness and is therefore tied closer to the ups and downs of the economy in general."



'But if there's no God, who changes our reels?'

Intel reaps 71% increase in 1984 profits

SANTA CLARA, Calif. — Intel Corp. last week reported fiscal year 1984 revenues increased 45% over 1983 and profits increased 71%. However, fourth-quarter results, reflecting an industrywide slowdown, showed a 50% decrease in profits compared with the year-earlier quarter.

Intel reported revenue of \$1.6 billion and profits of \$198 million, or \$1.70 per share, for the year ended Dec. 31; for 1983, the company had reported revenue of \$1.1 billion and profits of \$116 million, or \$1.05 per share.

In the fourth quarter just ended, Intel revenue was \$416 million, up from \$332 million for the fourth quarter of 1983. Profits, however, declined to \$23 million, or 20 cents per share, from year-earlier profits of \$47 million, or 40 cents per share.

Gordon E. Moore, chairman and chief executive officer (CEO) of Intel, said the strong market enjoyed by the company in the first half of the year "collapsed near year-end" as the rate of new orders dropped below the

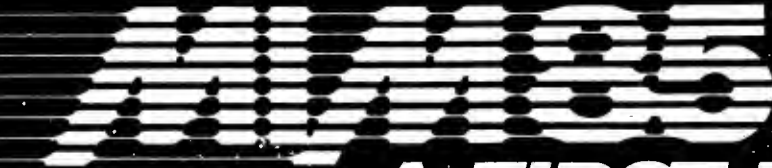
rate of shipments, and many customers canceled orders.

"As yet, we see no sign of any pickup in demand that we would ordinarily expect in a strong economy," Moore said. "I feel, however, we are well positioned with new products to resume growth with any market recovery."

Another semiconductor company reporting curtailed orders and rescheduling was Advanced Micro Devices, Inc. (AMD) of Sunnyvale, Calif.

AMD reported a third-quarter revenue of \$238.6 million, up from \$154.6 million a year earlier, and profits of \$29.3 million, or 50 cents per share, up from \$20.2 million, or 35 cents per share. AMD noted that the third-quarter profits were down considerably from the second-quarter level of \$42.1 million and said net orders in the third quarter were less than half of its shipments.

W. J. Sanders III, AMD president and CEO, said the company viewed the third-quarter decline as a "notch in our growth pattern" and not the beginning of a cyclical decline.



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COMPUTER INDUSTRY

Intel first to register design under chip protection act

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — The Semiconductor Chip Protection Act of 1984, signed into law last Nov. 8, got its first customer recently when Intel Corp. registered a chip design at the U.S. Copyright Office to secure legal protection from piracy.

Intel General Counsel Tom Dunlap submitted the circuit design for Intel's 27C256, an erasable programmable read-only chip with 256K bits of memory, to Acting Registrar of Copyrights Donald C. Curran at a ceremony and press conference here Jan. 7.

Intel was followed by representatives of Motorola, Inc. and Harris Corp. in the line to register the topo-

graphical designs for integrated circuits, called "mask works."

Though the federal law is administered by the Copyright Office, a unit of the Library of Congress, the statutory protection for chip designs is neither patent nor copyright, but a unique form of legal protection.

The law makes it illegal to reproduce any registered semiconductor pattern for 10 years after the layout is registered or first introduced, whichever occurs first [CW, Oct. 22]. Registration must occur within two years of commercial exploitation.

The Copyright Office opened the doors to registration on Jan. 7, after drafting regulations for implementa-

To register a chip pattern, a company or individual must submit documents such as a set of overlays or photographs that uniquely describe the original layout. Protected chips will carry the symbol "M" for mask work, surrounded by a circle or asterisks.

Industry-supported legislation

The legislation was strongly supported by the industry, led by the Semiconductor Industry Association of San Jose, Calif. "We took an active part in sponsoring the act because unauthorized chip duplication has been an industrywide problem for several years, especially since [integrated circuit] development costs

have risen dramatically of late," Intel's Dunlap commented.

"Now, semiconductor companies will have protection from pirates copying their complicated designs," he said.

"As a result, the Chip Protection Act will encourage the development of chips that were previously considered economically marginal," Dunlap added.

U.S. Rep. Robert W. Kastenmeier (D-Wis.) and U.S. Sen. Charles McC. Mathias Jr. (R-Md.), chief sponsors of the act, spoke at the ceremony and hailed the chip registration as an historic occasion.

"It's the first significant intellectual property created in [more than] 100 years," remarked Kastenmeier, who is known as "the dean of copyright" in Congress, according to Librarian of Congress Daniel J. Boorstin.

"Passage of the act shows that the modern-day Congress is ready, willing and able to devise rational solutions to thorny technological problems," Kastenmeier said.

New chapter for Copyright Office

Mathias said the new property right opens a new chapter for the Copyright Office.

"We can be more confident that Americans in the future can continue to enjoy the fruits of technological progress and continue to take advantage of a creativeness . . . that has flourished under the shelter of intellectual property laws since the nation's earliest days," he said.

"It's a pleasure to see this fruit of six years of labor," said U.S. Rep. Don Edwards (D-Calif.), who first introduced a chip protection bill in 1978.

"I'm delighted that the Copyright Office, with its usual excellence, has moved so quickly to implement the new law," Edwards added.

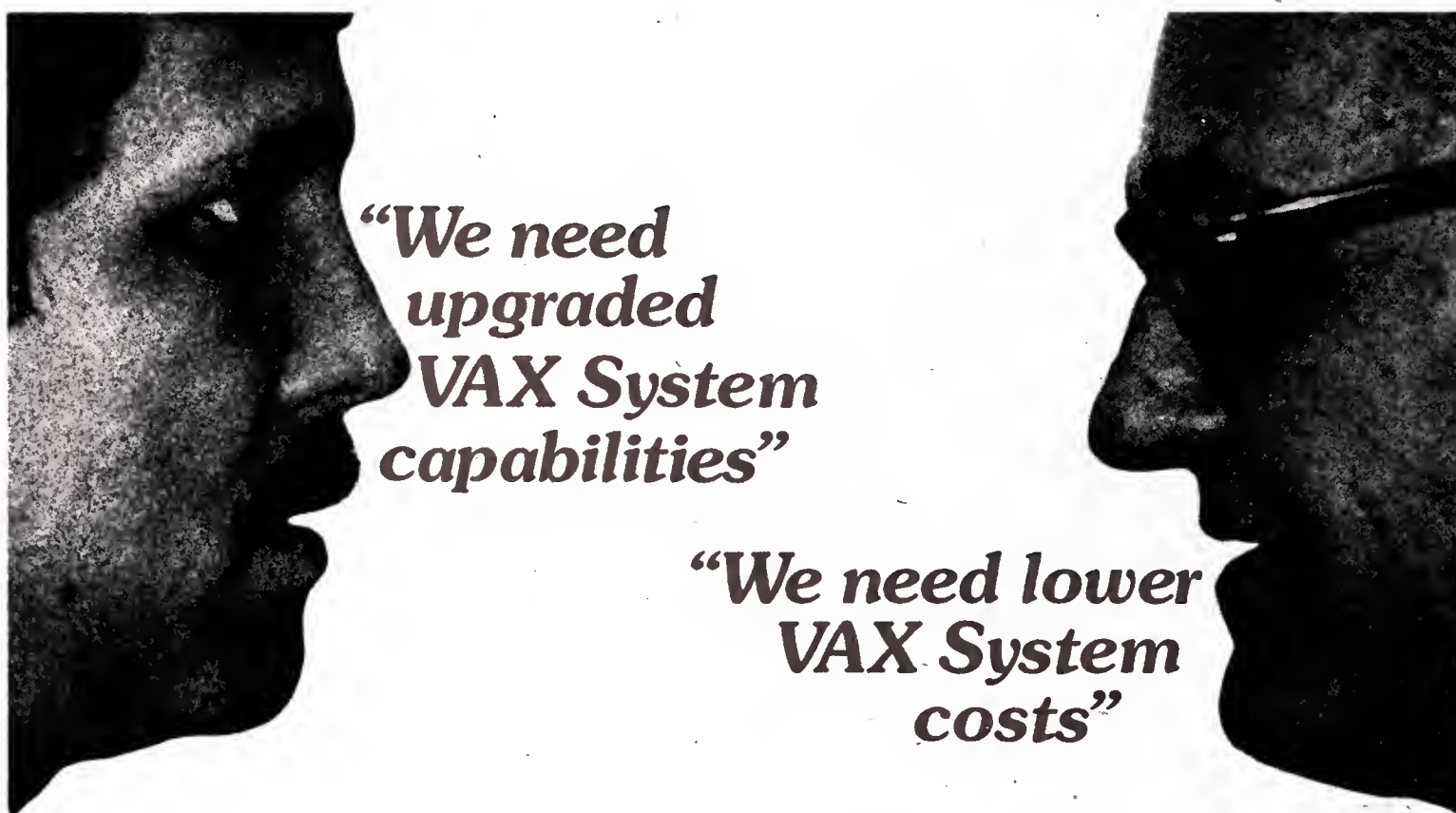
STC founder resigns position

LOUISVILLE, Colo. — Storage Technology Corp. (STC) reported last week that company founder Jesse I. Aweida resigned his position as chairman of the troubled company effective Jan. 19.

Aweida, who is a major shareholder in the company, will remain as a member of the company's board of directors. STC filed for protection under Chapter 11 of the Federal Bankruptcy Act last Oct. 31, hoping to hold off creditors long enough for the company to reorganize.

In mid-November, Aweida relinquished the function of chief executive officer; some analysts had predicted creditors and shareholders would demand he turn over any functional control of the company as a condition of any reorganization plan.

Once a stable vendor of storage tape products, STC mushroomed in size when IBM suffered production delays after announcing thin-film head storage products. STC then poured money into an attempt to develop an IBM-compatible mainframe, only to cancel the project last year.



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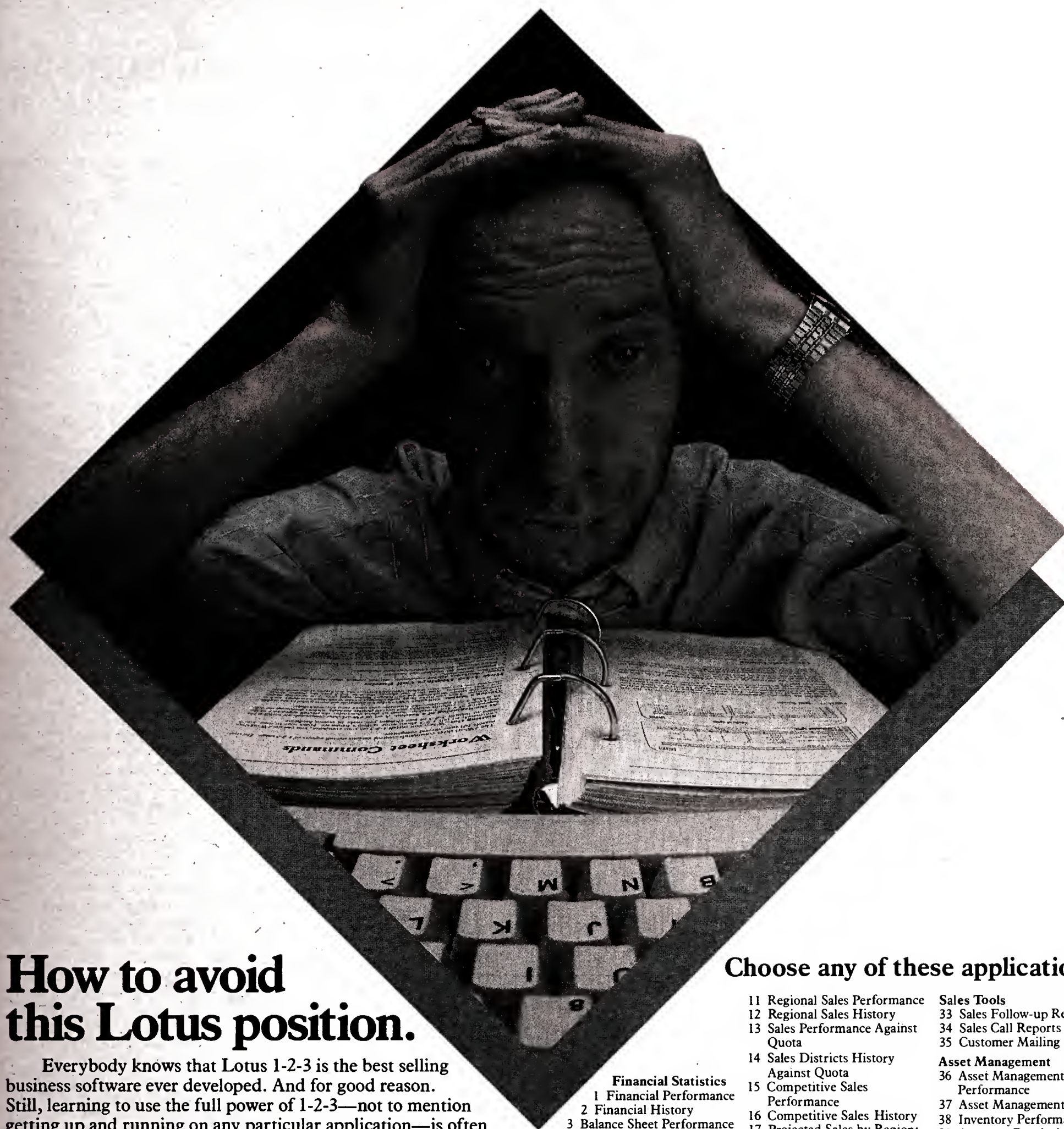
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COMPUTER INDUSTRY

MAI reports \$12.4 million loss

Revenue up as company moves toward liquidation

NEW YORK — Management Assistance, Inc. (MAI), which has announced agreements to sell its two operating units and to dissolve the company, reported a loss of \$12.4 million, or \$1.65 a share, for the fourth quarter ended Sept. 30.

The \$12.4 million loss re-

flected an extraordinary tax credit of \$300,000, or 4 cents a share.

The company lost \$33,000, or less than 1 cent a share, after receiving an extraordinary tax credit of \$254,000 in the comparable quarter one year earlier.

Revenue in the fourth

quarter rose 16% to \$118.3 million from \$102.3 million during the year-earlier period.

For the fiscal year 1984, the company lost \$8.2 million, or \$1.12 a share, reflecting a \$1.1 million favorable gain resulting from an accounting change and the credit of \$300,000.

Revenue from MAI's Sorbus Service Division rose 15% to \$51.1 million from \$44.4 million reported during the fourth quarter a year ago.

DOD from page 79

non-Communist countries facing license review by the Pentagon to 15 at any one time.

Specific categories of products that will come under scrutiny are computers, scientific measuring and testing devices, microchip manufacturing technology, raw materials used in the manufacture of semiconductors and semiconductor manufacturing equipment.

MART from page 79

first half.

That much growth is not nearly enough to sustain an industry that has been on an ambitious capital spending spree for more than a year. The chip industry is extremely cyclical, and manufacturers have tended to ramp up for further growth when a boom cycle is already far advanced; that results in capital spending plans outliving the life of the boom.

The last boom held in its vices not only U.S. vendors but also vendors throughout the world, including the Japanese, European concerns and a fledgling but optimistic Korean industry.

With everybody ramped up for growth based on the levels of late 1983 and early 1984, it would seem that a 2% to 5% growth rate in the largest market for semiconductors is going to result in vicious competition among the leading companies to capture that growth. That can only lead to price-cutting and reduced revenue growth.

Of course, there are factors that could alleviate the potential problems: the home computer market living up to its full potential and demand for multiuser business micros exceeding expectations. But there are also factors that could worsen the problem, such as an economic downturn that would curb business spending and cut into the sales of semiconductors to automakers and appliance makers.

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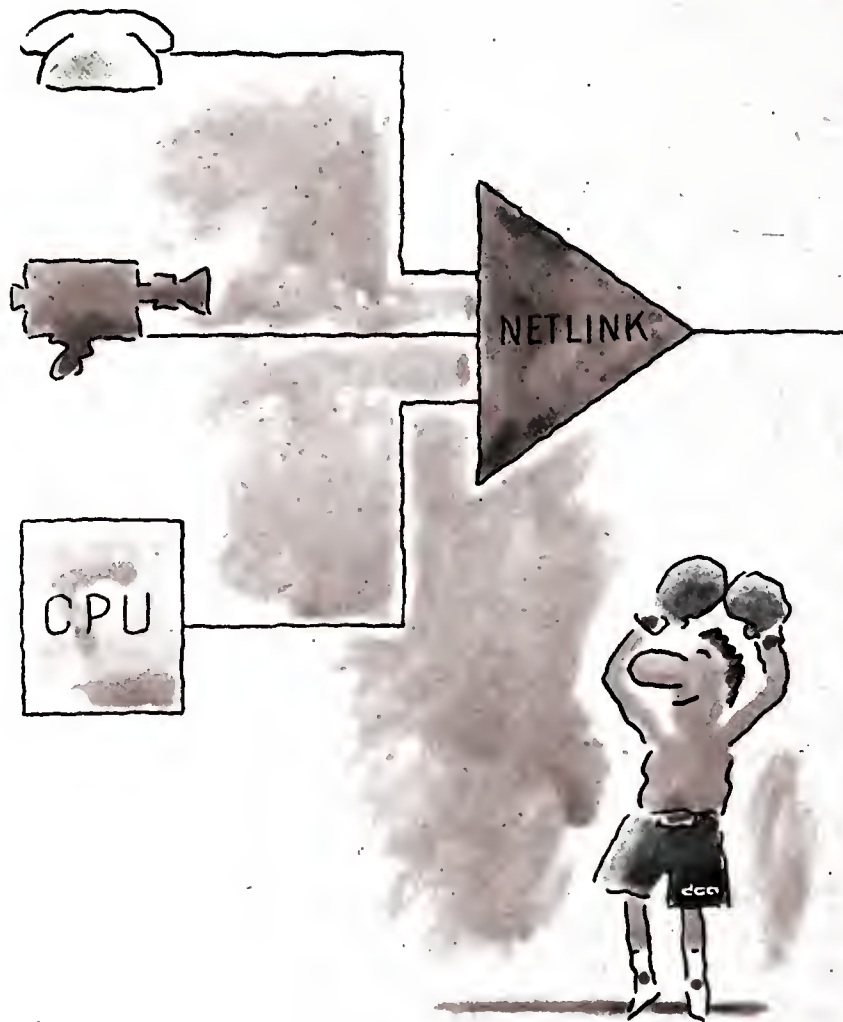
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COMPUTER INDUSTRY

NBI sets merger with Computer Consoles

Acquisition pending approval, valued at \$160 million

BOULDER, Colo. — NBI, Inc., based here, recently announced it will acquire Computer Consoles, Inc. (CCI) of Rochester, N.Y., during this quarter, subject to stockholder and regulatory approvals, in a transaction valued at \$160 million.

NBI, which manufactures software-based office automation systems, reported revenues of \$187 million and profits of \$14.9 million for the 12 months ended Sept. 30. CCI, a leading supplier of fault-tolerant computer systems to the telephone industry and also a supplier of advanced computing systems to the office systems market, reported reve-

nues of \$135 million and profits of \$11.2 million for the 12 months ended Sept. 30.

Under the terms of the proposed merger, Herman A. Affel Jr., chairman of CCI, will become chairman of the board of the company. NBI President Thomas S. Kavanagh will become president and chief executive officer of the company.

If approved by shareholders of both companies and government agencies, the companies would be merged through NBI's issuing approximately 0.8 shares of new stock for each share of CCI's common stock outstanding. Based on the Jan. 10

closing price of NBI, the transaction is valued at \$160 million.

Company officials said they expect few changes in employment at the respective locations of the two companies. The two companies together employ more than 4,000 people and operate more than 200 sales and service locations worldwide.

In a joint statement, Affel and Kavanagh said the two companies complement one another. "We believe that the new company will be in a stronger position to compete in the office systems and advanced computing systems markets than either company alone would be," they said.

Martin Marietta reveals Oxford Software buy

BETHESDA, Md. — Martin Marietta Data Systems, a division of Martin Marietta Corp., has acquired \$11 million Oxford Software, Inc. of Hasbrouck Heights, N.J., maker of the UFO application generator and on-line applications development software.

The move is Martin Marietta's second software company acquisition. In August 1983, the firm acquired Mathematica, Inc., maker of the Ramis II fourth-generation language and acquisition system.

According to a Martin Marietta spokesman, the acquisition ranks the company among the country's five largest independent software vendors, increasing its strength against Cincom Systems, Inc., which manufactures the Mantis fourth-generation language application development system, and Pansophic Systems, Inc., developer of the Gener/ol system for IBM's CICS. Martin Marietta software sales alone are \$150 million, the spokesman said.

Neither company would reveal the terms of the acquisition, but an Oxford spokesman said the company would remain an independent subsidiary of Martin Marietta and that Oxford President Judd Shanker would retain his position.

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Osborne to end Chapter 11, reenter mart

FREMONT, Calif. — Osborne Computer Corp., the first major casualty in the microcomputer industry shakeout, was scheduled to emerge last Friday from Chapter 11 protection of the Federal Bankruptcy Act.

The end of Chapter 11 proceedings coincides with a limited public stock offering of \$3 million to California residents and overseas investors. Osborne filed for protection under Chapter 11 on Sept. 13, 1983, after a number of setbacks that shook the industry and set a pattern for failures of microcomputer companies.

Ronald J. Brown, president of the restructured company, noted the unique status of Osborne, remarking that it was the first company to enter the portable computer field, the first micro vendor to go into Chapter 11 proceedings and the first to reenter the market.

"We have been a bellwether of the industry from day one, and we continue to be," Brown said.

Osborne, founded by the often colorful and controversial Adam Osborne, was the first of the micro start-ups to stumble on its own overly aggressive marketing strategy. It announced a follow-up product to the successful Osborne I long before the company was ready to manufacture the machine in quantity, with the result that sales of the original computer dried up and the company experienced negligible revenues.

COMPUTER INDUSTRY

Gavilan set to liquidate; prospects for sale unlikely

By Kathleen Sullivan
CW West Coast Bureau

CAMPBELL, Calif. — In mid-December, two months after it sought protection under Chapter 11 of the Federal Bankruptcy Act, Gavilan Computer Corp. quietly gave up the ghost. The portable computer firm notified a bankruptcy court here that the prospects for selling the firm were unlikely and that it planned to liquidate any remaining assets.

The court notice closes the books on a company that attracted much attention in the spring of 1983, when it introduced one of the first briefcase-size computers and obtained \$31 million in venture capital financing on the promise of delivering a lap-size computer.

Within four months, Gavilan had garnered \$100 million in orders for the first machine. But the privately held firm was unable to ship the product for a year because of production delays and technical problems.

In the interim, the competition among vendors of briefcase-size systems intensified as other U.S. and Japanese firms entered the field. Companies such as Hewlett-Packard Co. and Data General Corp. stole the spotlight from the fledgling firm. In addition to increased competitive pressure, Gavilan was plagued with management problems, according to analysts.

Venture investments lost

When Gavilan filed for bankruptcy in early October, it owed \$10 million to creditors, including \$3.5 million to California-based Bank of the West, its secured creditor. Venture capitalists, who had poured \$31 million into the firm during its 2½-year lifetime, lost their investments.

Eagle to trade stock for debts

GARDEN GROVE, Calif. — Eagle Computer, Inc. said recently that it has reached agreement with unsecured creditors to exchange stock for about \$4.2 million worth of debts, a sum representing about two-thirds of its total trade debt.

Under the terms of the agreement, participating creditors will receive a total of 5.6 million shares of Eagle stock, valued at 75 cents per share.

Gary Kappenheim, Eagle president and chief executive officer, said the agreement "is a major milestone in Eagle's turnaround plan . . . from a balance sheet standpoint, the company is stronger than it has been since mid-1984."

Midway through last year, Eagle stumbled from a highflier among vendors of microcomputers compatible with the IBM Personal Computer to become one of several firms on the verge of extinction.

Eagle's major problem was IBM, which filed a lawsuit alleging copyright infringement of its Basic Input/Output System. Eagle settled the lawsuit by agreeing to develop a noninfringing Bios of its own.

Like Victor Technologies, Inc. and Osborne Computer Corp. — two computer companies that recently emerged from Chapter 11 proceedings with new funding and new management — Gavilan had hoped to find a buyer. But it was unsuccessful.

In documents dated Dec. 14 and signed by attorneys for Gavilan, the Bank of the West and the committee of unsecured creditors, the company converted from Chapter 11 to Chapter 7 proceedings.

Under Chapter 7, a trustee appointed by the court attempts to collect assets — if any are available — for the benefit of unsecured creditors, according to L. Neil Gendel, a San Francisco lawyer who represented Gavilan.

But, Gendel added, it seems improbable that unsecured creditors will be reimbursed.

FRANKLIN from page 79

proved by a creditors committee and must be approved through a ballot of all creditors.

Morton E. David, the chairman and chief executive officer appointed one month before the bankruptcy filing last June, explained in a recent interview that the success of a new Apple-compatible operating system and continued dealer loyalty has enabled Franklin to revise its plans.

Market has accepted FDOS2

Regarding the operating system, FDOS2, Morton said, "the marketplace has accepted it with alacrity . . . [and] the feedback from dealers has been excellent."

He claimed that a hard core of 300 dealers has continued to sell Franklin products despite a requirement that dealers pay for equipment in advance or upon delivery.

Last May, Franklin introduced its CX series of computers, but Morton said the company has no intention of manufacturing that series.

Instead, he said, the company will

continue to manufacture its Ace 1000 microcomputer until the product has been exhausted, adding, "That will dovetail nicely with a new product line."

Apple suit biggest problem

Franklin suffered from the general downturn in the personal computer market and from a rapid series of management changes that saw the company appoint three chief executives in three months. But the greatest problem was the Apple lawsuit that caused Franklin to stop shipping products while it developed FDOS2.

Morton observed that Apple has no objection to the revised Franklin plan.

"We have a complex agreement with Apple," he explained. "It's not peace, but it's not war."

With the ability to run software developed for the Apple II line without facing copyright battles, he noted, "our future is in the Apple universe for the foreseeable future." He added, however, that at some point Franklin's plan is to branch out of that arena.

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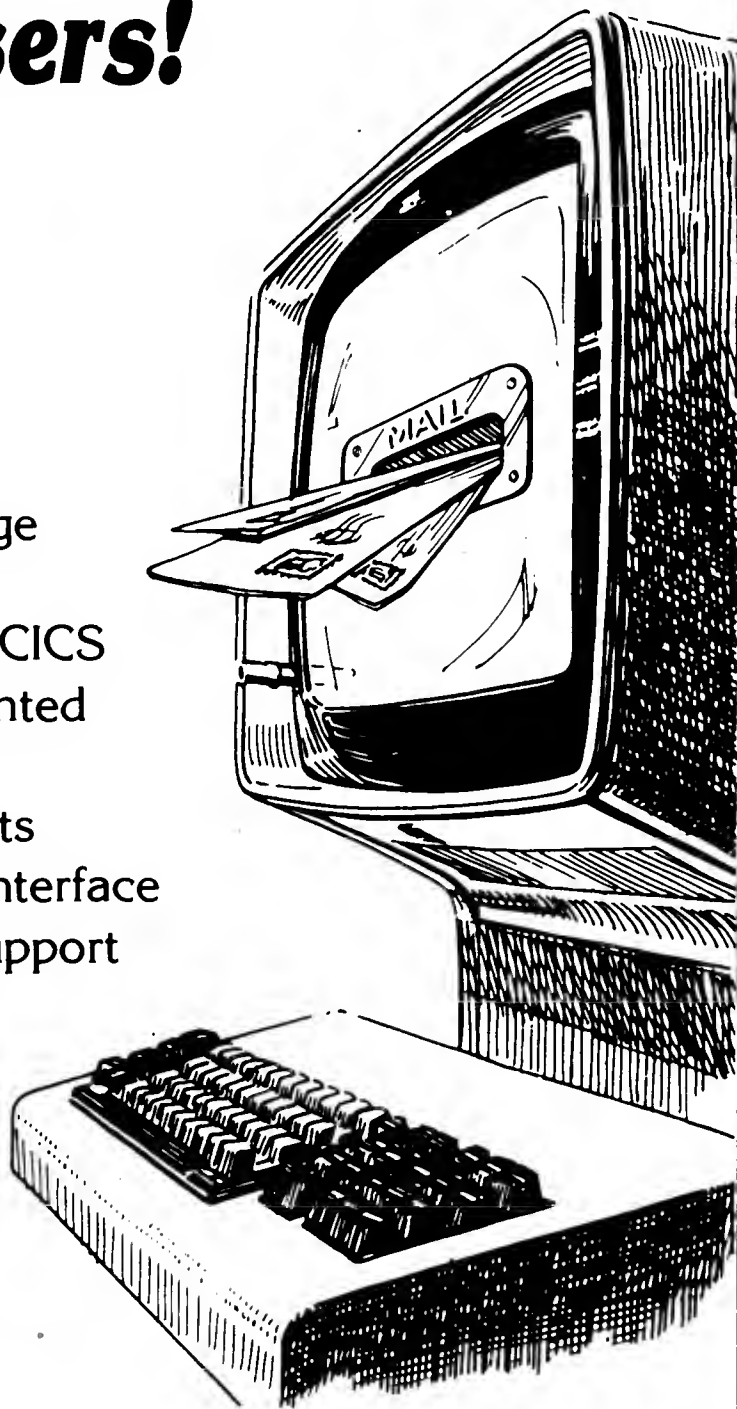
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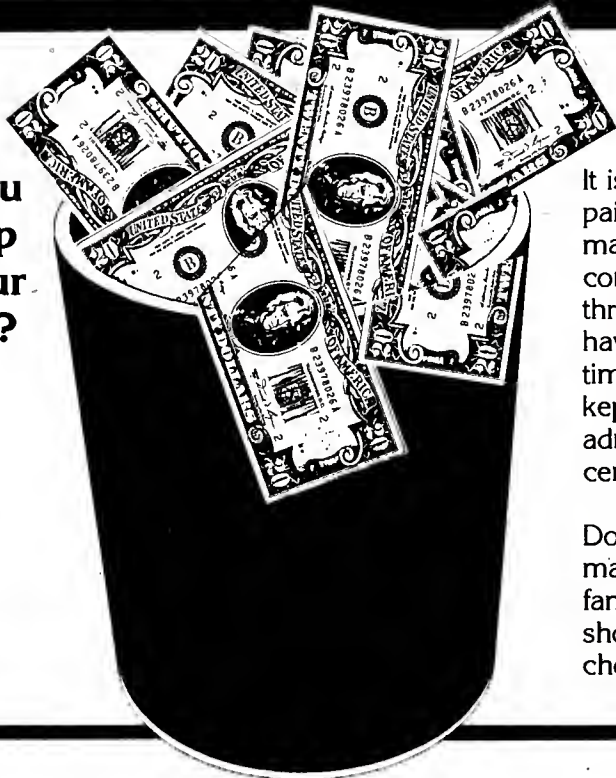
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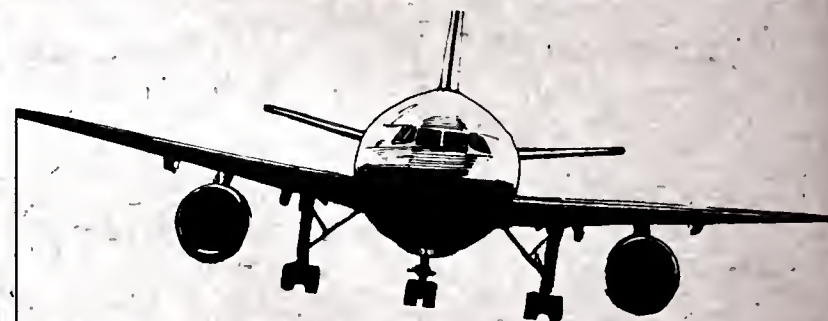
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MCBA, an established author/wholesaler of Acctg./Mfg. pkgs., has a need for a Cobol Programmer with at least two-three years experience on the TI990/DX10 programming Acctg. or Mfg. pkgs. Familiarity with MCBA pkgs. a plus.

RSTS

Established software house needs RSTS expert to assist with major enhancements and expansion of existing product lines. Familiarity with MCBA pkgs and DIBOL a plus.

PROGRAMMER

Established S/W house has an immediate opening for a person with strong UNIX expertise. Exposure to SOFTBOL/DIBOL or MCBA Pkgs a plus. This varied and challenging position involves converting S/W, troubleshooting and some customer contact.

We offer excellent salaries and growth potential and good location in a suburb twenty minutes north of Los Angeles. Call or rush resume to

MCBA

2441 Honolulu Avenue
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Attn: Personnel Manager
(818) 957-2900

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Seasoned individual needed with real skill in assembler and debug. IBM VM and MVS, DBMS or SQL experience helpful. We manufacture a fully implemented 4th generation mainframe securities trading and accounting system, and are the technology leaders in our market. Unbeatable working conditions, excellent compensation and benefits package for the right person. Send resume in confidence to:

KOCH SYSTEMS CORP.

70 Tenth Street, 1st Floor
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Delivering innovative systems in an exciting and competitive marketplace is a formidable challenge—one that we accept.

At work within the Micro Products Division and Sperry Network Systems groups, we'll surprise you with uncommon opportunities for career growth in state-of-the-art microprocessor and network communications technology.

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At Sperry, you'll work in a business environment which encourages your participation as you share responsibility with other team members, for developing new generations of micro-based products and data communications systems.

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If you are interested in the Sperry challenge, please send your resume to:

SPERRY, Employment Dept., Attn: Dept. 1A
322 N. Sperry Way, Salt Lake City, Utah 84116

We are an equal opportunity employer m/f/v/h.

System Developers 800-231-5920

Inviting resumes from individuals in the more highly technical computer related vocations such as: PHD Computer Scientists, Operating System Developers, Data Base Developers, Porting Specialists, Networks and Telecommunications, Architecture, Artificial Intelligence, Graphics Systems Developers, Microcoders and Firmware Developers, Compiler Development, etc. Special interest in emerging technology such as novel architecture, UNIX, ADA, etc. Similar interest in scientific applications developers including military, process control, data acquisition, telemetry and communications, CAD/CAM, simulation and modeling, etc.—we are a professional employment firm managed by graduate engineers. Fees are paid by the employer. All geographic locations. Send resume or call D.A. Redwine and ask for our free resume workbook & career planner.



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FINANCIAL SYSTEMS CONSULTANTS

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We are seeking financial systems consultants with 2 to 5 years COBOL financial systems experience in one or more of the following environments: IBM Mainframe; IBM S/38; Wang VS; DEC VAX; HP 3000. CPA, MBA, "Big 8" consulting background, or knowledge of Software International accounting packages is a plus.

Compensation is to \$50K, with excellent benefits and opportunity for career advancement. Send a resume and cover letter with salary history to:

Mr. Knute E. Holum
Myers Holum, Inc.
400 Montgomery Street, Suite 801
San Francisco, CA 94104

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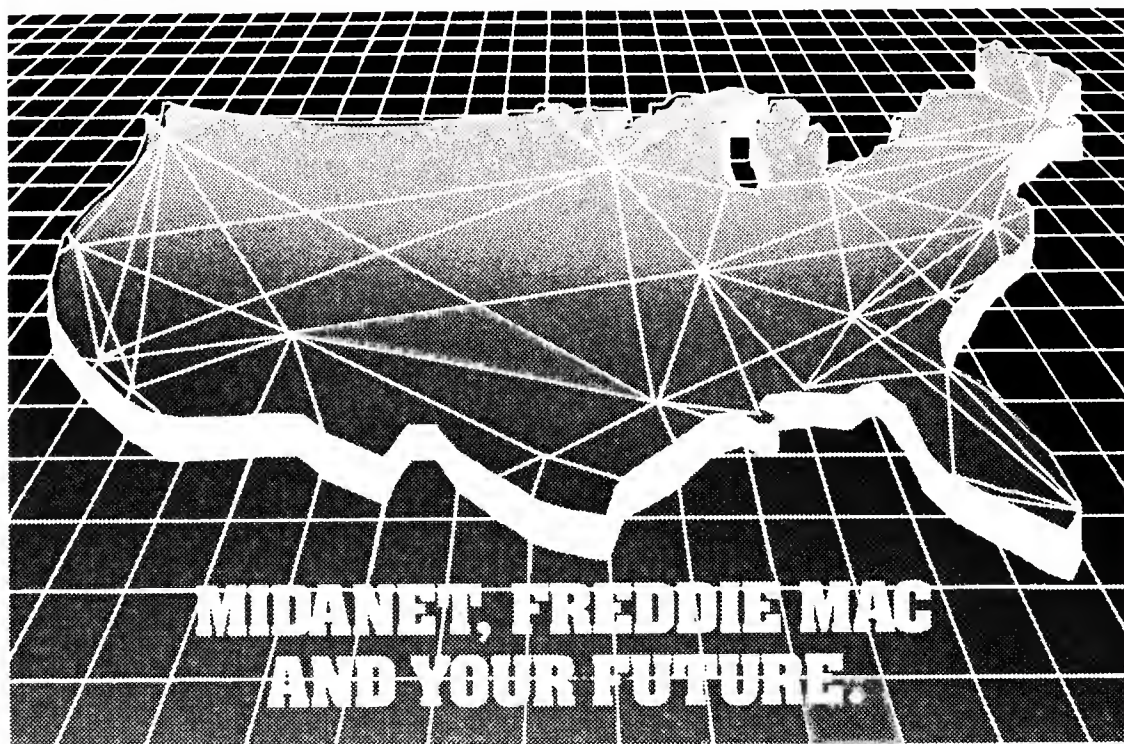
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Computer Professionals



Nothing beats being "at the right place, at the right time." Right now Freddie Mac is the right place for accomplished Computer Professionals. We are already the leading force through innovative application of technology in the multi-billion dollar secondary home mortgage market, revolutionizing the way borrowers borrow, lenders lend and investors invest in the huge, nationwide home buying market.

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Our equipment is state-of-the-art. IBM 3081 mainframe. We recently migrated from MVS/370 to MVS/XA. We develop our own software. Constant development has put us out front in our industry and we have no intention of relinquishing our lead.

Show us a good background in IBM, CICS, IMS, JCL and TSO in an OS environment and 3 years' experience and we'll point you toward a no-limits career. We have a wide range of positions available from Programmers, Systems Analysts and Systems Programmers through Production Control Technicians and Computer Operators.

For immediate consideration, please call Lois Sylver at (202) 789-5158, or send your resume in confidence to: Freddie Mac, P. O. Box 37248, Dept. LS-5, Washington, D.C. 20013. We are an Equal Opportunity Employer with a Commitment to Affirmative Action.

MOLY CORP. INC. SYSTEMS ANALYST SYSTEM 38

Moly Corp. Inc. has an immediate opening for an S/38 Systems Analyst.

The ideal candidate will possess a minimum of 3 years programming/analyst experience in RPGIII and CL programming. Experience with J.D. Edwards accounting packages would also be a definite plus.

Located in a remote area of the northern New Mexico Sangre de Cristo mountain. It is an ideal location for the outdoors enthusiast. Skiing, hunting, fishing and hiking are excellent in this area.

Interested candidates should send a resume complete with salary history to:

Moly Corp. Inc.
P.O. Box 469
Questa, NM 87556
ATT: Tom Huff
(505)586-0212

Equal Opportunity Employer M/F

President International Software Distribution

A New England-based information technology company is seeking an executive experienced in the field of international microcomputer software marketing and distribution, to become President and CEO of a new business unit whose goal is to set up a worldwide software distribution network.

The right candidate should have experience in international marketing in the microcomputer field, and a proven track record as results-oriented manager, excellent negotiating skills, and knowledge of international trade and business practices. We are a high growth company with sales in the half billion dollar area, yet with a strong entrepreneurial spirit. We offer an attractive career opportunity to the right candidate, with an excellent compensation package and equity participation opportunity.

Reply to CW-B4118
Computerworld
Box 880
Framingham, MA 01701

TECHNICAL MANAGER DATA MANAGEMENT SECTION

The South Carolina Tax Commission is in the process of building a professional, technical/management team in its Information Resource Management Division. The commission will be using a centralized host computer in an IBM 3081 mainframe hardware environment with MVS/SP 1.3, TSO, PANVALET, IDMS software systems. This manager reports to the Director, IRM Division and directs the activities of a varied technical staff responsible for the database administration, data dictionary administration, voice/data communications, systems quality assurance, and systems standards administration. An undergraduate degree with 5 years technical software experience with a minimum of 1 year supervisory experience or an equivalent combination of education and experience. Salary range \$29,974 - \$42,486. Send resume to:

**SC Tax Commission
Personnel Department
P.O. Box 125
Columbia, SC 29214**

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404-971-7281**

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Brockway, Inc. (NY), a Fortune 350 manufacturer of packaging products is currently expanding its operations. As a result, new opportunities have been created at our Corporate headquarters for experienced MIS professionals.

PROJECT LEADER — Analyze business problems and guide assigned applications analysts in the design, implementation, and maintenance of computerized systems. Prefer degree plus 5 years application development experience.

APPLICATIONS ANALYST — Assist with design specifications; develop structure charts, codes, documents, installs, and maintains computer based systems. Prefer degree plus minimum of 2 years systems analysis and design experience with demonstrated problem-solving skills.

MVS SYSTEMS PROGRAMMER — Lead position with 2-3 years experience in MVS installation and internals, problem determination and systems maintenance. Capacity management and communications experience desirable.

DATA BASE ANALYST — Responsibilities will include design and implementation of database systems as well as providing database related assistance to the programming staff. Position requires a strong application background with at least 1 year database design experience with IDMS. A Bachelor's degree will be a plus.

A working knowledge in any of the following environments is preferred for these positions:

- OS/MVS/JES2
- CICS
- IDMS, ADS/O
- TSO/SPF, LIBRARIAN

Headquartered in the foothills of the Alleghenies, the area provides an ideal setting for family living with varied year-round recreational activities. We offer competitive salaries, comprehensive benefits and ample opportunities to reach your full potential with a growth-oriented, diversified industry leader. For additional information, call (814) 261-6292 or direct your resume including salary requirements to:

Lawrence Kutsch
Manager, Salaried Employment
Department 49

BROCKWAY, INC. (NY)
McCullough Avenue
Brockway, PA 15824

Brockway

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SENIOR SYSTEMS ANALYSTS

IMS DB/DC CICS

We are a major national organization and the leader in our field with headquarters in Chicago. We are expanding our information systems staff and are seeking qualified Senior Systems Analysts to function as project leaders in key positions. Projects you will work on have national implications. Responsibilities include technical development, from project inception to product implementation, and support of application software systems, including research and analysis, general and detail specifications, program coding, product testing, user training and product implementation.

EXPERIENCE REQUIREMENTS:

- College degree or equivalent; MBA a plus.
- Minimum of 5 years experience in developing and successfully implementing large scale EDP systems.
- Background in COBOL in a large frame IBM environment a must. Exposure to IMS and/or CICS is highly preferred.
- Project leadership experience desired.
- Must possess demonstrated superior oral and written communications skills (writing sample will be requested).
- Ability to travel approximately 15%.

We offer highly competitive salaries and an excellent benefit package that includes fully paid health care, dental and prescription drug coverage, noncontributory pension plan, 401K, and tuition reimbursement. Interested candidates send your resume with salary requirements to:

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Box 880, Framingham, MA 01701**

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MIS PROFESSIONALS

Our Fortune 100 corporation has immediate career opportunities for MIS Professionals seeking visibility, technical development, and rapid advancement. These positions are available as the result of major expansion and reorganization of the MIS function in response to the corporation's business growth. You will have the opportunity to enjoy working in a dynamic environment utilizing IBM's most current state-of-the-art technology.

- Director Systems and Programming \$90K
- International Systems Consultant \$55-65K
- Data Base Administrator (IDMS) \$65K
- Manager of Technical Support \$75K
- Senior Software Programmer \$50K
- Director of Internal Consulting \$80K

Our company offers excellent benefits, a comprehensive relocation package, and a very attractive midwest location ideal for family living.

Reply to CW-B4117, Computerworld
Box 880, Framingham, MA 01701

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Exciting opportunity to work with latest IBM technology, including IBM 36 with 30 terminals and IBM personal computers, plus WANG OIS System. Full range of administrative systems either in place or planning.

IBM 34/36 experience and demonstrated system design work required.

Send resume, including salary requirements, to:

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Box 48-D
Berklee College of Music
1140 Boylston Street
Boston, MA 02215

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College of Music**

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WANTED**

For major manufacturers throughout the Sunbelt. Our client companies have enlisted our services to find qualified individuals with experience in CICS and in large scale IBM environments.

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Vicki Fagg
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Columbia, SC 29202.

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We offer excellent employee group health insurance benefits program, non-contributory pension plan and generous vacation policy. Qualified applicants should submit resume and salary history in confidence to:

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- **Technical Trainer**—\$35-48,000
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For information and immediate response on these and many other positions call or write to:

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Data Processing Division
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Beachwood, Ohio 44122
216/464-5100

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If you're looking for career challenge with vast opportunities for growth, SHAPE could be right for you. We're committed to innovative research and development and manufacturing, yet our basic philosophy begins and ends with people...our greatest resource.

Come grow with us.

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A position is available for a highly motivated individual to develop and implement a distributed processing network to automate all data acquisition functions for several manufacturing facilities with sales exceeding \$50,000,000. The work will involve data based management, interfacing to automated production equipment, and implementing a network to best serve SHAPE's rapid growth environment. Applicants should have experience in using and installing distributed system networks.

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Human Resources Manager
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Career Opportunities

The News

Sunday

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COMPUTER SALARY SURVEY AND CAREER PLANNING GUIDE

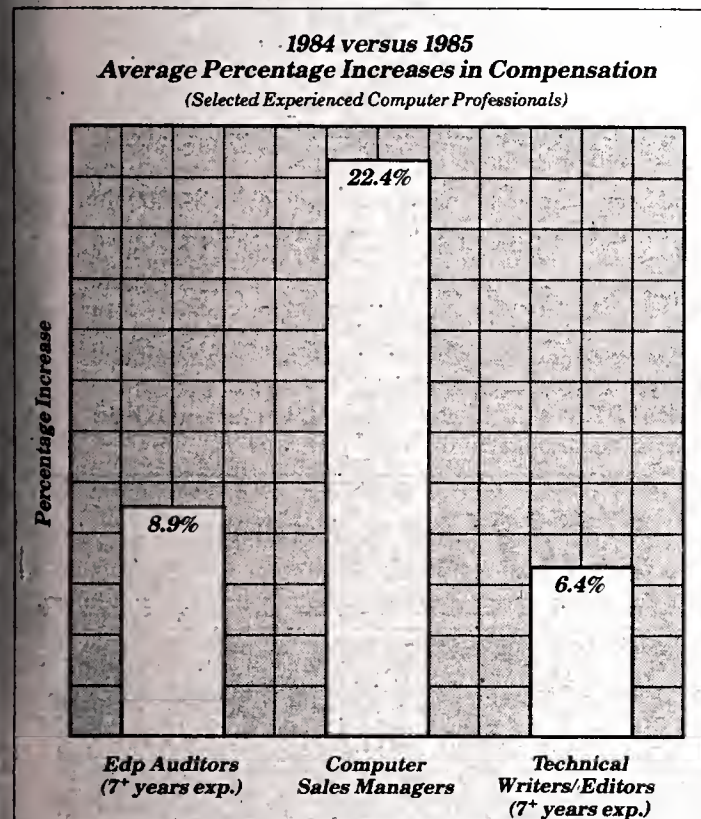
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Get the latest data in our new, free 1985 Computer Salary Survey and Career Planning Guide.

With a strong economy and business outlook, salaries for some computer professionals have increased since 1984—by as much as 22%! Are you keeping pace with your peers?



Who will get the biggest increases?

- While our 1985 Computer Salary Survey reviews more than sixty different position and experience levels, there are vast differences in how much some computer professionals earned last year compared to what they can expect to make in 1985.

Our most comprehensive Survey ever

The new 1985 *Computer Salary Survey and Career Planning Guide* is based on contacts with more than 48,000 information processing and computer professionals and 35,000 firms that hire them. Included is a review of salaries at sixty-three different position and experience levels. So no matter if you're in programming, systems analysis, design, software, communications, operations, sales, marketing or management, you'll learn whether or not your salary is keeping pace with your peers—and what you can expect to earn as you advance your career.

A program to help you progress

In addition, the new Survey includes a number of comprehensive charts, exhibits and graphs which are designed to help you gain a thorough understanding of emerging industry and career trends and what you could do to capitalize on them. Through documented case studies, you'll also learn why some computer professionals advance while others do not—despite the positive economic outlook.

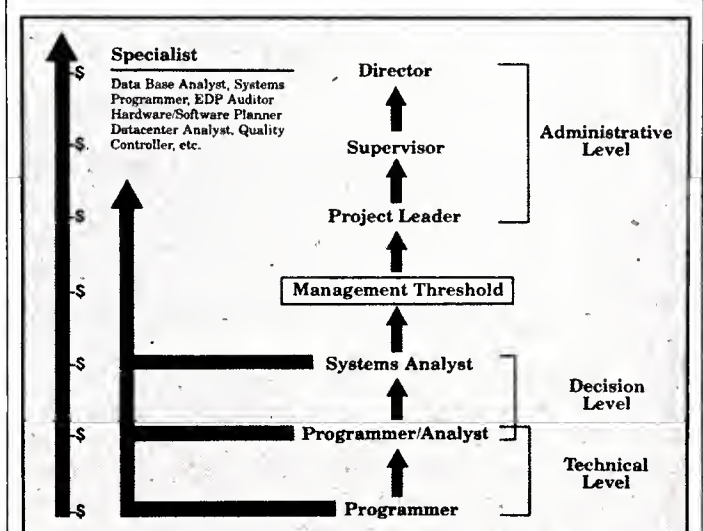
Included is a seven-step career planning system that can help you assess your current position and take corrective action when and if needed. This is a unique system that Source Edp developed and refined over the last twenty-three years, which has helped thousands of computer professionals advance in their careers.

Free to computer professionals

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ACP/TPF SYSTEMS PROGRAMMERS

Responsible for ACP/TPF systems software to include at least 1 or more of the following areas:

- Control program internals (ACP/TPF)
- Communications control program (CCP)
- ACP file support areas
- ACP performance management and tuning
- Utility and test tool program support

Review new ACP/TPF support requirements, design enhancements, and develop necessary modifications. Evaluate new ACP/TPF releases, retrofit TWA developed modifications and install new releases. Programmer to project leader levels will be considered.

ACP/TPF SYSTEMS TRAINER

Responsible for developing new ACP/TPF training courses, refining existing course material, presenting the training course to non ACP/TPF programmers or programmer trainees, and developing assistant instructors for technical training.

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TWA offers this along with the opportunity to be part of an aggressive software development team which plans to bring TWA's systems software to a high state-of-the-art level. TWA also offers excellent fringe benefits, worldwide travel privileges, and relocation benefits. Qualified and interested candidates are invited to submit their resume to:

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Qualifications: Candidates must have appropriate academic background; sufficient knowledge of the technical aspects of the field to be able to make sensible decisions about the acquisition of equipment and software, and the ability to articulate these clearly to non-technical administrators and faculty; demonstrated managerial experience, preferably within an academic organization; and ability to maintain a harmonious relationship with subordinates. Salary is fully competitive and based upon qualifications.

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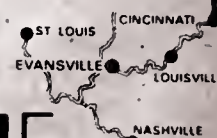
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INDUSTRIAL PROCESS CONTROL

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As a project manager, you will have overall responsibility for major automated process control systems projects. You will develop project plans for real-time control and plant management systems, manage the efforts of ten to twenty talented systems professionals and direct projects through to completion. These positions require a B.S. in computer science or electrical engineering and six to ten years of experience in the development of real-time control systems including substantial management and client interface experience.

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DATA PROCESSING PROFESSIONALS

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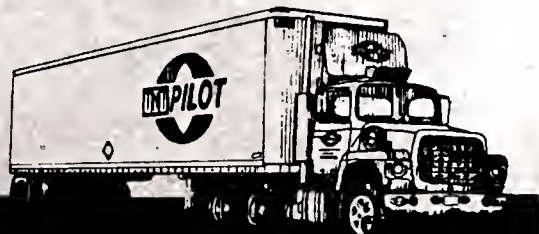
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Challenge your knowledge of memory management techniques, task management algorithms, physical and logical I/O drivers and file access techniques on new system architectures.

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Is your expertise in developing network software for use in a distributed processing environment? We would like to talk to you about your exposure and experience with SNA/SDLC/ HDLC/X.25/HASP. Knowledge of assembler and high level languages (i.e. Pascal, MODULA-2) desirable.

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- In-depth knowledge of business graphics software, user needs and applications
- Strong software engineering background, emphasis in computer graphics
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Joy Manufacturing Company is seeking an individual to perform the duties of Senior Technical Specialist in our management information systems department. The successful candidate will work with all aspects of an SNA network using NCP, VCNA, and VTAM including installation, customization, testing, implementation and operation of the networks as well as providing technical support for IBM personal computers in our Information Center.

Qualifications: a degree or the equivalent in computer science or a related field is desirable. A minimum of 4 years experience in systems programming for VSE preferably in a VM environment. Minimum of 2 years experience with VTAM and NCP. VCNA experience a plus. Technical knowledge of the IBM personal computer, particularly networking them with an IBM 4300 host, is preferred. Please forward resume and current salary to Manager of Salaried Employment:

Joy Manufacturing
120 Liberty Street
Franklin, PA 16323

FACULTY POSITIONS DEPARTMENT OF COMPUTER SCIENCE UNIVERSITY OF WISCONSIN-PLATTEVILLE

The University of Wisconsin-Platteville is located in the rolling and wooded hills of Southwest Wisconsin. Platteville, a community of approximately 10,000, is 70 miles southwest of Madison, Wisconsin, and some 25 miles from both Dubuque, Iowa, and Galena, Illinois. This location offers an abundance of recreational, cultural and professional opportunities.

The University is comprised of five colleges (Business, Industry and Communication; Engineering; Agriculture, Education; and Arts and Sciences) with an enrollment of over 5,000 students. Graduate programs at the Master's level are offered in Education, Industrial Technology, and Agriculture.

The Department of Computer Science currently has ten faculty members and offers a comprehensive major with emphases in mathematics, business, and electronics. Computer support is provided by IBM 4331 DOS/VSE and DEC VAX 780 VMS systems, as well as by numerous microcomputers.

Responsibilities: The person must be competent to teach beginning and advanced courses in computer science. This individual must be willing to advise undergraduate students, contribute toward department curriculum development, and assume responsibilities for some department functions.

Qualifications: Master's degree in computer science and teaching experience is required and advanced degrees are preferred.

Applications are invited for tenure-track positions starting in August 1985. Applicants from all areas of computer science will be considered, with applicants in networks, artificial intelligence, data bases, data communications, micro computer architecture being of special interest.

Salary will be competitive and commensurate with qualifications and experience. Academic rank will depend upon qualifications and experience.

Send a letter of application and resume by February 28, 1985, or until a suitable candidate is found, to:

Chairperson
Department of Computer Science
Pioneer Tower 418
University of Wisconsin-Platteville
Platteville, WI 53818

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- Knowledge of systems and applications software as related to computer security

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Regular positions require a minimum of three years' professional experience. Senior positions require a minimum of five years' professional experience in the analysis and design of on-line information systems for: power plant facilities management; engineering configuration management; engineering records management.

If the above describes your background and you are interested in being considered please send resume, **salary history** and **salary requirements** in confidence to: K.W. Greager, Dept. DF, UNC Nuclear Industries, P.O. Box 490, Richland, WA 99352. U.S. Citizenship required. Equal employment opportunity is our pledge and our practice.

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Position as Manager and Chief Programmer on IBM System 36 in academic setting. Systems design and RPG II experience necessary. Salary commensurate with training and experience. Fringe benefits include paid vacation, retirement, medical/dental/life insurance. Submit letter of application and resume to:

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Framingham, MA 01701

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These positions require COBOL programming analysis experience in an IBM/Amdahl mainframe environment using TSO and ROSCOE. Leadership skills are needed for some positions. CICS and Claims processing experience desirable.

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Primary responsibilities of the position will be to provide classroom and hands-on training of OCLC staff, develop courses to be taught by others; and to prepare OCLC staff to instruct these classes. Qualified applicants should possess an in-depth knowledge of the UNIX operating system, the "C" programming language, and development support tools for UNIX/C. Also required is a degree in computer science (or an equivalent academic/experience combination), experience in developing and conducting software classes and 3 years design/programming in a UNIX/C environment. The selected applicant will be a self-starter/learner and have excellent verbal and written communication skills.

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OCLC Human Resources
Department - CW
6565 Frantz Road
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Online Computer Library Center

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WE'RE LOOKING FOR COMPUTER SCIENTISTS

The University of Wisconsin-Eau Claire is accepting applications for several tenure-track faculty positions in the Department of Computer Science for the 1985-86 academic year, starting August 19, 1985. Responsibilities include teaching both introductory and advanced courses as well as providing academic advising to students.

Salaries are competitive and commensurate with qualifications and experience. University fringe benefits such as health and life insurance are also provided. Qualifications include a Ph.D. (Master's degree acceptable) in computer science with emphasis in system software or hardware organization and experience with high-level languages including Pascal. Experience in graphics or artificial intelligence desirable but not necessary. If you are interested in joining a teaching community that is committed to the achievement of excellence, please submit a letter of application, resume and three letters of recommendation to:

Dr. David A. Nuesse, Chairman, Department of Computer Science
University of Wisconsin-Eau Claire
Eau Claire, WI 54701
715-836-2526

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TECHNICAL SUPPORT ANALYST

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ANALYST/ PROGRAMMER

Will design, code, test, document and maintain programs. Train and assist computer users in the use of programs for on-line hospital database applications, including patient registration, admissions, clinic scheduling, medical records, pharmacy and protocol administration. 1 or more years' MUMPS/MIIS experience preferred or 1 or more years' experience in minicomputer database applications using block structured programming languages. Bachelor's degree preferred; healthcare experience helpful.

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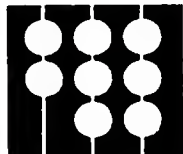
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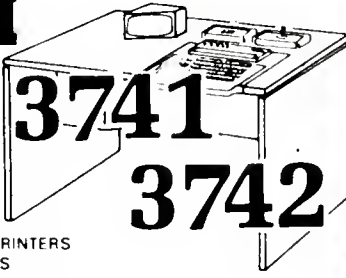
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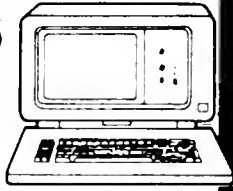
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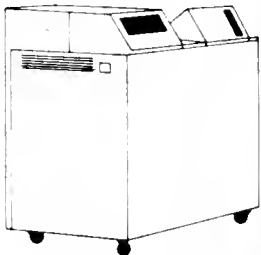
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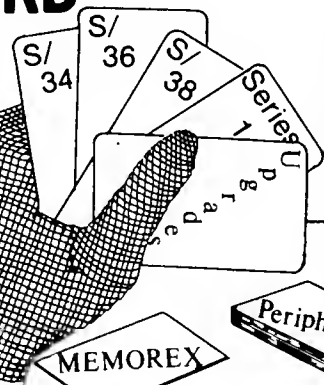
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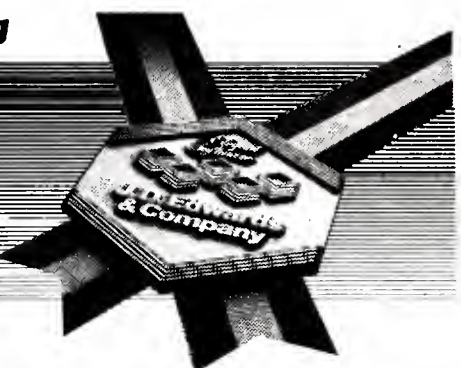
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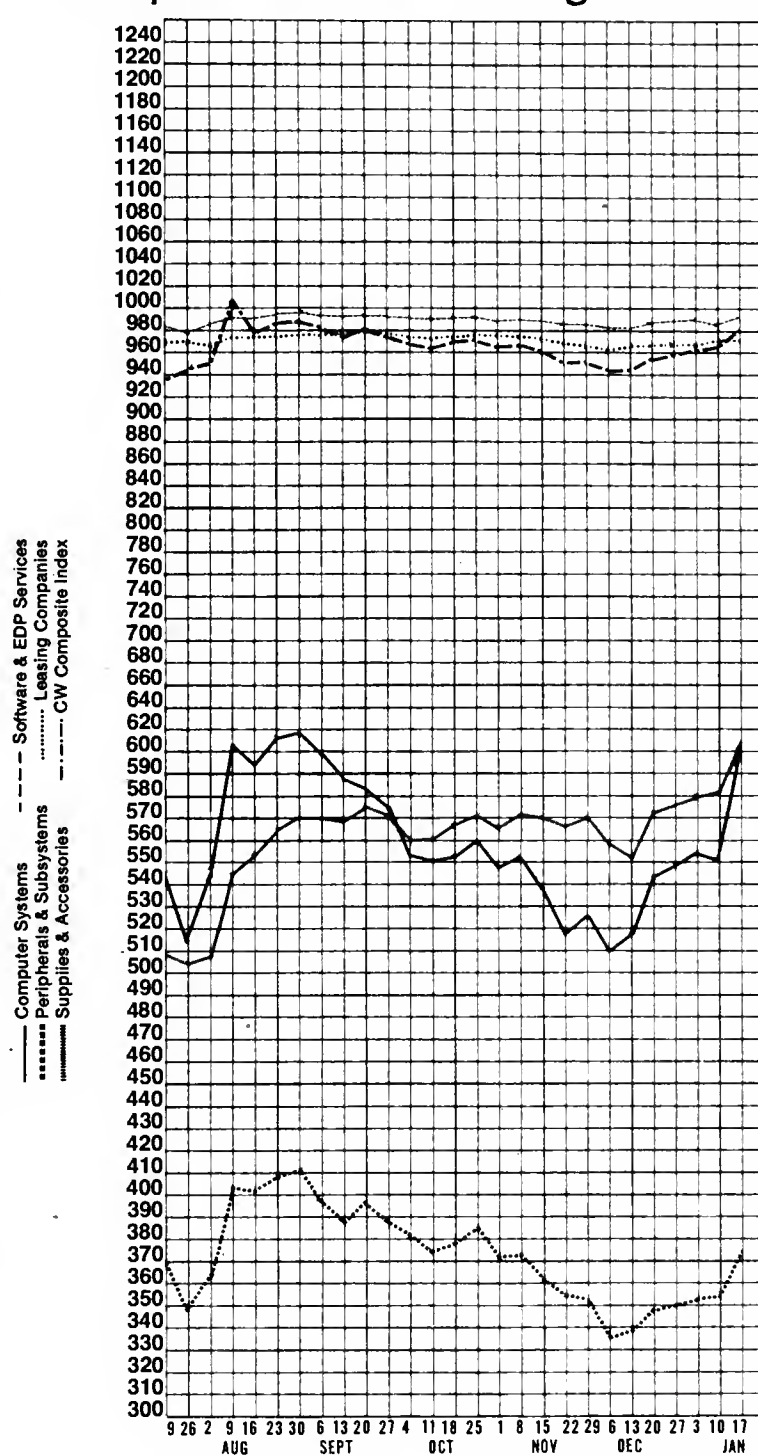
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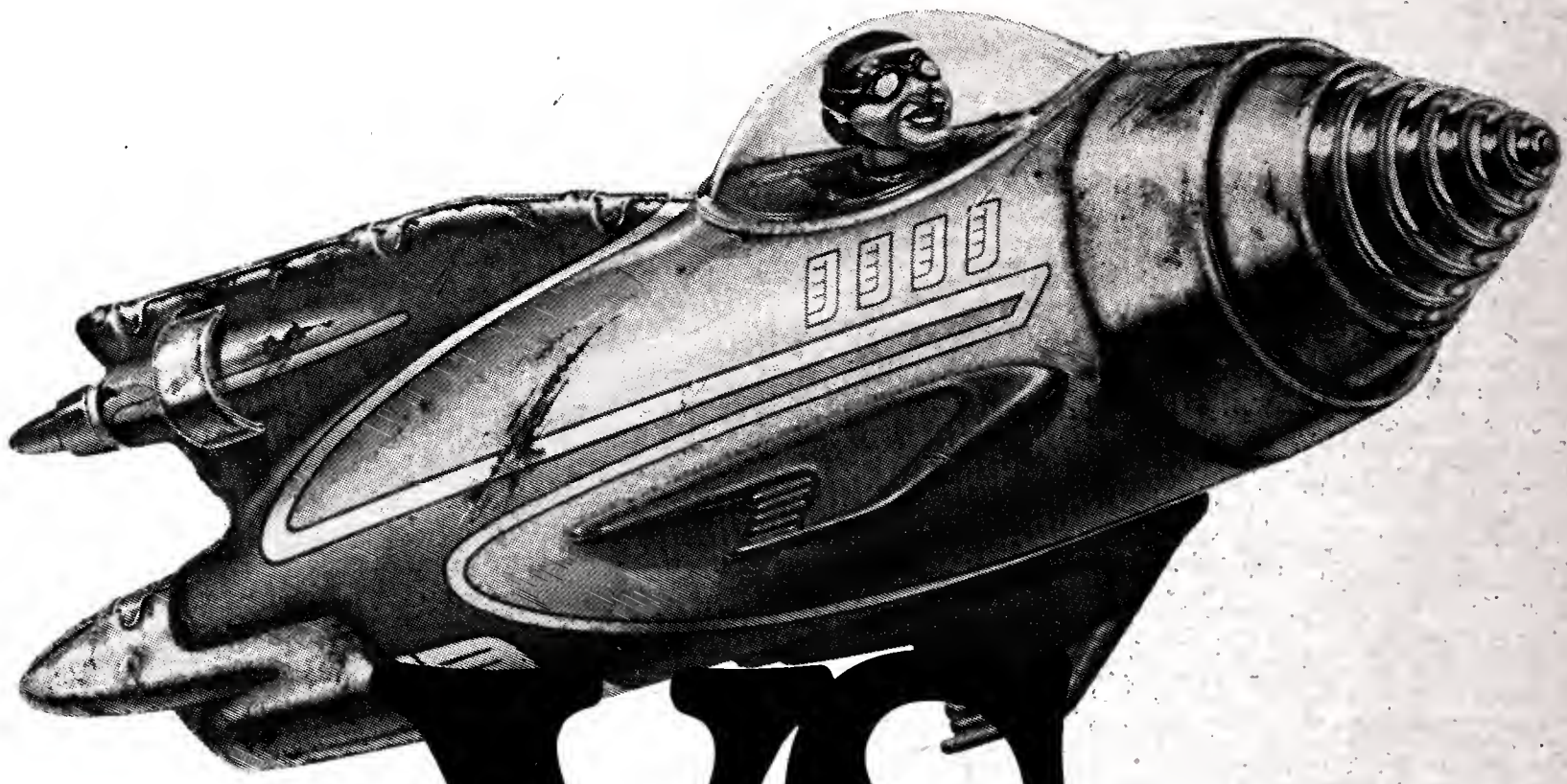
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F C H	1984-85 RANGE	CLOSE JAN 16 1984	PRICE		WEEK CHNGE	WEEK PCT CHNGE
			1984-85 RANGE	1984-85 CLOSE JAN 16 1984		
COMPUTER SYSTEMS						
D ALPHA MICROSYSTEMS	6-24	7 5/8	-1/4	-3.1		
D ALTOS COMPUTER SYST	7-21	8 3/4	+5/8	+6.8		
A ANDAL CORP	10-30	14 1/2	+3/8	+2.6		
D APPLE COMPUTER INC	18-63	30 1/4	+1 1/2	+5.2		
N AT&T	15-21	20 5/8	+1/2	+2.4		
N BURROUGHS CORP	44-61	61 1/4	+5 1/8	+8.1		
D COMPAQ COMPUTER CP	4-15	7 3/8	+3/4	+11.3		
D COMPUTER AUTOMATION	3-17	4 1/2	+1 1/8	+3.3		
A COMPUTER CONSOLES	8-26	12 5/8	+1 1/4	+10.8		
N CONTROL DATA CORP	25-62	35 3/8	+7/8	+2.5		
D CONVERGENT TECHNOL	5-41	9 1/8	+1 1/4	+15.8		
N CRAY RESEARCH INC	39-59	58 1/4	+6 3/4	+13.1		
D DAIY SYSTEMS CORP	14-28	27 1/4	+4 1/4	+18.4		
N DATA GENERAL CORP	27-59	58 1/8	+4 1/8	+7.5		
N DATAPOINT CORP	14-31	21 1/2	+1/2	+2.3		
N DIGITAL EQUIPMENT	64-125	112	+7 5/8	+7.3		
A ECR INC	12-18	15 5/8	-1/8	-0.7		
N ELECTRONIC ASSOC.	3-15	3 1/8	+1/8	+4.1		
N FLOATING POINT SYST	13-44	23 3/8	+3 5/8	+18.3		
N FOXBORO	28-47	29 3/8	-1/8	-0.4		
SOFTWARE & EDP SERVICES						
D ADVANCED EDP TECH	2-8	2 1/4	0	0.0		
N ADVANCED SYSTEMS INC	9-22	10 3/4	+1/8	+1.1		
D AFS COMPUTERS INC	10-32	15 1/4	+1 1/2	+10.9		
D AMERICAN SOFTWARE	12-31	16 3/4	+1 1/4	+8.0		
N ANACORP INC	2-19	1 7/8	-1/8	-6.2		
D ANALYSTS INTL CORP	5-17	6 1/4	+1	+19.0		
A APPLIED DATA RES	18-37	30 1/4	+3 1/4	+12.0		
D ASHTON TATE	6-15	7 1/4	+3/4	+11.5		
D ASK COMPUTER SYSTEMS	13-21	18 3/4	+1	+5.1		
N AUTOMATIC DATA PROC	1-7	1 3/8	+1/8	+15.0		
N AUTOMATIC DATA PROC	30-44	40 5/8	+1 1/4	+3.1		
D COMPUTER ASSOC INT'L	15-35	21 1/2	+3	+16.2		
D COMPUTER HORIZONS	8-20	7 1/4	0	0.0		
D COMPUTER NETWORK	5-11	9	+3/8	+4.3		
N COMPUTER SCIENCES	11-23	15 5/8	+1 3/4	+12.6		
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D COMPUTONE SYSTEMS	4-23	6	+1/4	+4.3		
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D CONSHARE	6-14	7 3/8	+5/8	+9.2		
N CULLINET SOFTWARE	24-50	48 3/4	+5 1/2	+12.7		
D CYCARE SYSTEMS INC	16-25	22	+1 1/2	+7.3		
D HOGAN SYSTEMS INC	7-27	7 1/8	+3/8	+5.5		
N GENERAL ELECTRIC CO	45-59	59	+1 5/8	+2.8		
N GTE CORP	36-48	42	+1	+2.4		
N INFORMATION GENERAL	14-32	17 1/2	+2	+12.9		
D INFORMATION SCIENCE	4-17	4 1/4	0	0.0		
D INFOTRON SYSTEMS CP	15-43	22 3/4	+3 3/4	+19.7		
D KEANE ASSOCIATES	6-15	11	+3/4	+7.3		
A LOGICOM	18-31	27 1/2	+2 1/2	+10.0		
D LOTUS DEVELOPMENT CP	15-40	25 1/4	+1 1/4	+5.2		
D MCI COMMUNICATIONS	6-28	9	+1 1/8	+14.2		
D MGT SCI AMER INC	9-33	13	+1 3/4	+15.3		
D MATHEMATICAL APP GRP	6-18	6	-1/2	-7.6		
D MICOR SYSTEMS INC	27-30	31 5/8	+5 1/8	+19.3		
D MICROPRO INT'L CP	2-10	3	-3/8	-11.1		
D NATIONAL DATA CORP	8-26	9	+1/4	+2.8		
D ON-LINE SOFTWARE INT	4-29	5 3/4	+1 1/2	+35.2		
D PANSOPHIC SYSTEMS	11-30	15 7/8	+1 1/2	+10.4		
N PLANNING RESEARCH	10-21	14	-1/4	-1.7		
D POLICY MGT SYST CP	22-35	28 1/4	+2 5/8	+10.2		
D PROGRAMMING & SYS	4-8	4 1/2	+1/2	+12.5		
D REYNOLDS & REYNOLD	28-53	37 3/4	+3 3/4	+11.0		
D SEI CORP	11-34	14	+1/4	+1.8		
D SHARED MEDICAL SYST	23-43	29 3/4	+2 5/8	+9.6		
D SCIENTIFIC COMPUTERS	5-14	5 1/4	0	0.0		
D SOFTWARE AG	9-18	18 3/8	+2 3/8	+14.8		
N URS CORP	10-18	12 3/4	+7/8	+7.3		
N UCCEL	7-17	14 1/8	+1	+7.6		
PERIPHERALS & SUBSYSTEMS						
P AM INTERNATIONAL	2-7	3 3/4	0	0.0		
A ANDERSON JACOBSON	3-26	3 7/8	+1/2	+14.8		
D AUTO-TROL TECHNOLOGY	8-28	9 3/4	+1	+11.4		
D AVANT-GARDE COMPUTING	11-29	14 1/8	+2 7/8	+25.5		
D BANCORP INC	5-22	7 1/4	+1	+16.0		
A REEVE INT'L	1-11	5/8	0	0.0		
N BOLT-BERANEK & NEW	17-30	24 3/8	+3 3/8	+16.0		
D CAMBEX CORP	1-3	1 7/8	+1/8	+2.1		
N CENTRONICS DATA CORP	8-28	9 1/4	-3/8	-3.8		
A CETEC CORP	7-12	7 5/8	+1/2	+7.0		
N COGNITRONICS	4-20	5 1/8	-1/4	-4.6		
SUPPLIES & ACCESSORIES						
N AMERICAN BUS PRODS	17-23	21 1/4	+1/2	+2.4		
N BARRY WRIGHT	21-33	24	+2 5/8	+12.2		
A DUPLEX PRODUCTS INC	22-28	27 3/4	+3/4	+2.7		
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